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AUTOMOTIVE INDUSTRIES
VOLUME 57 *Philadelphia, Saturday, July 23, 1927* NUMBER 4

Five Months' Exports— Business 25% Heavier Than *in* Same Period *of* 1926

Total shipments of motor vehicles from U. S. and Canada up to June 1 was 220,115. America's position is secure despite stiffening of competition.

By K. W. Stillman

AUTOMOTIVE exports have been exceptionally good during the early part of this year and there appear to be no indications that this condition will change greatly during the rest of 1927.

Passenger car exports increased considerably during the first five months of 1927 over the similar period last year, the rate of increase being more than twice as great as that made in 1926 over 1925.

Total exports increased 25 per cent over the first five months of 1926 while exports of that year were but 17 per cent greater than 1925.

In general, all foreign markets for American vehicles increased their purchases during the early part of this year and in only a few are financial or business conditions such as to indicate that sales may decline during the coming months.

One factor which is having considerable influence upon sales of American cars is the competition offered by manufacturers of other countries, especially those with which preferential tariff arrangements are in force with the purchasing country. Although this may develop to greater extent in the future than it has in the past, it is safe to say that so far American manufacturers have been able to compete successfully in all countries except those with exceptionally burdensome tariffs.

Total export shipments from the United States and Canada during the first five months were 161,190 cars and 58,925 trucks, making a total of 220,115 vehicles. To obtain a true picture of American activities abroad some part, at least, of foreign assembly sales should be added to these figures. Data for only the first three months are available on foreign assemblies but during this period 44,700 American vehicles were assembled and sold from foreign plants.

Not all of these foreign assembly sales may be counted as additional foreign business since, as the Automotive Division, Bureau of Foreign and Domestic Commerce, points out, a considerable portion of parts destined for assembly in foreign assemb-

Exports of Passenger Cars—First Five Months 1926 and 1927

	1926 Units	1927 Units	1926 Value	1927 Value
U. S. Cars	111,076	138,954	$81,409,889	$101,087,011
Canadian Cars	24,367	22,236	11,396,686	11,120,150
Total	135,443	161,190	$92,802,034	$112,207,161

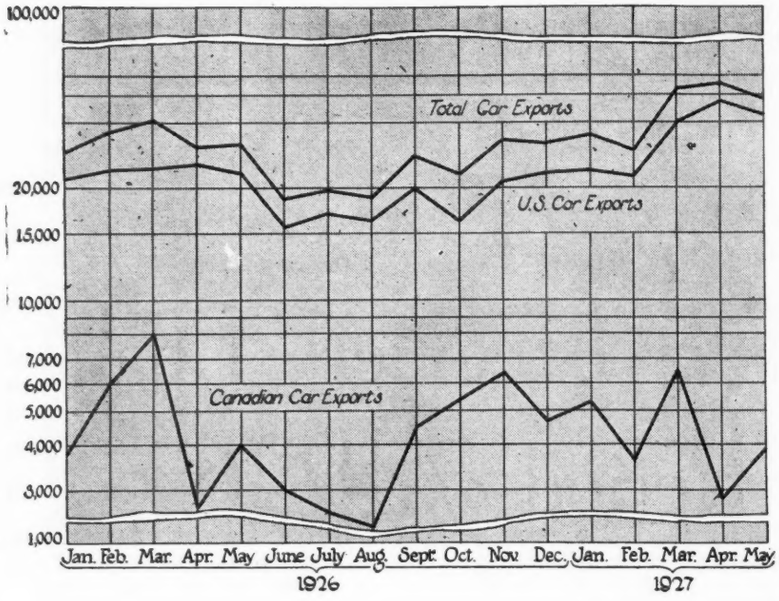
Exports of Trucks—First Five Months 1926 and 1927

	1926 Units	1927 Units	1926 Value	1927 Value
U. S. Trucks	31,091	49,652	$20,928,466	$29,928,763
Canadian Trucks	9,783	9,273	3,302,751	3,128,473
Total	40,905	58,925	$24,308,973	$33,057,236

Exports of Total Vehicles—First Five Months 1926 and 1927

	1926 Units	1927 Units	1926 Value	1927 Value
U. S. Vehicles	142,167	188,606	$102,338,355	$131,015,774
Canadian Vehicles	34,150	31,509	14,699,437	14,248,623
Total	176,317	220,115	$117,037,791	$145,264,397

Passenger Car Exports



U. S. and Canada Passenger Car Exports, First Five Months, to Some Important Markets

Destination	1926	1927
Australia	22,150	25,467
Canada	12,131	18,192
Argentina	14,605	18,170
Denmark	7,217	10,906
United Kingdom	2,775	9,910
Brit. So. Africa	8,463	9,714
Brazil	8,685	8,991

ling plants are reported as complete units, so have already been included in complete vehicle export figures. According to the Division, from 40 to 50 per cent of foreign assemblies have been so declared so that the actual increase in American foreign trade indicated by foreign assembly sales figures would be about one-half their total.

The rapid growth of foreign assembly plants has also brought in a source of error in allocating exports to ultimate markets. For example, during recent years Denmark has been taking on increasing importance, according to export figures, as a market for American-built motor vehicles. As a matter of fact, although the actual market in that country undoubtedly is growing and probably will continue to do so, no small part of the reported exports to Denmark are made up of parts for assembly in the several assembly plants located there and eventually are sold in other European countries.

This condition exists to some extend in all the countries where there are extensive assembling operations and, while it has no effect upon the total export figures, it does need consideration in making comparisons between individual foreign markets.

Australia Still First

Combining United States and Canadian exports as representing total exports of vehicles of American design, it is seen that Australia continues to hold first place in both car and truck exports. In accompanying tables are given comparative export figures to some of the leading markets for the first five months of 1926 and 1927. It may be seen from these that with the exception of British India in regard to car exports, and the United Kingdom in regard to trucks, sales of both cars and trucks have increased in all these countries during 1927. This condition, in the main, holds throughout all the countries in which American cars are sold.

In the case of car exports, none of the increases were exceptionally great although Canada increased its imports from this country by about 50 per cent. The markets for trucks, however, expanded greatly in several instances. Australia purchased over 70 per cent more trucks from this country during the first five months of this year than during the same period of 1926. Brazil multiplied its purchases almost four times. British South Africa jumped from a negligible place in our truck market list to become a leading contender with Brazil and Denmark for second place.

Argentina better than doubled its truck purchases and this trend, in general, was carried out through all the foreign truck markets.

The future of the export trade appears to be bright. In certain localities, conditions are not altogether favorable to the rapid consumption of such relatively high priced commodities as motor vehicles but there is a very general trend throughout the entire world toward motor transport for passengers and freight which temporary local depressions may obstruct for a time but cannot permanently halt.

Conditions in the various Dominions of the British Empire are generally favorable to increased automotive sales. The British industry, however, is exerting very great pressure to bring a larger share of these sales to their own doors. As an example of what they are doing along this line a delegation of British manufacturers journeyed to Australia early this year in order to learn just what conditions had to be met by cars and trucks employed there. Although this visit undoubtedly will be advantageous to British makers, a leading Australian automotive man told the delegation that in spite of all their efforts American cars still held the advantages over all others in price, power and marketing and servicing methods.

Futher illustration of Australian interest in automotive activities is seen in the Melbourne Show held last May which was attended by some 103,000 persons and at which there were 57 exhibitors of cars.

Perry J. Stevenson, American Trade Commissioner for South Africa, writing in *The American Automobile* (Overseas Edition), says, "Looking ahead for the next five years and judging by present trends, there is every indication that material lowering in initial and operating cost of cars and increases in purchasing power and population will contribute to an increased demand for cars in South Africa."

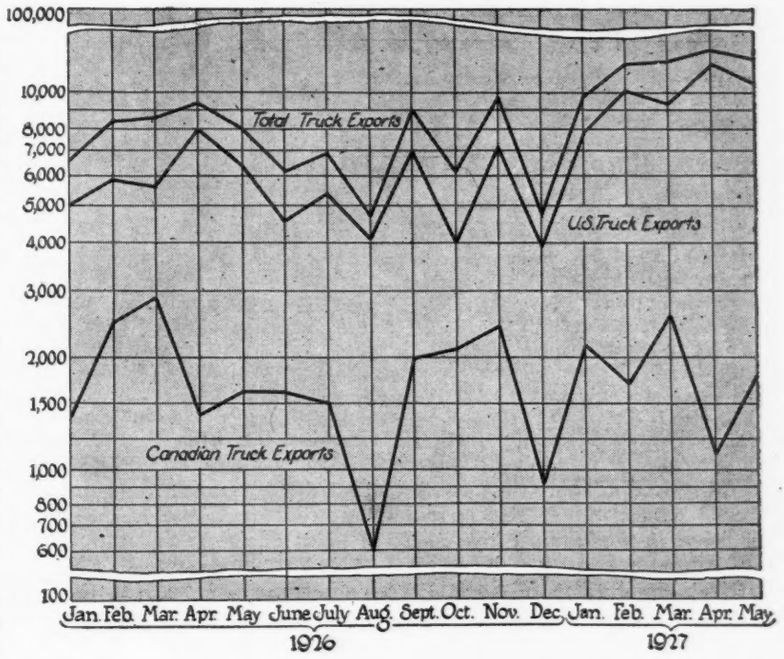
British East Africa is developing into an important automotive market and so far American vehicles have had the preference. India and Egypt are rather quiet at present although there are few signs that sales will drop to any considerable extent.

The South American markets are generally in fair condition, the trends being upward at present. In Argentina sales have been a bit slow but are improving. In Brazil, high prices, taxes and duties, have tended to slow up automotive sales, but, as can be seen in the accompanying tables, it is still buying large num-

U. S. and Canada Truck Exports, First Five Months, to Some Important Markets

Destination	1926	1927
Australia	8,352	14,280
Denmark	2,339	4,232
Brazil	1,454	5,083
Brit. So. Africa	757	4,022
Brit. India	2,417	3,395
Argentina	1,471	3,065
United Kingdom	4,494	2,666

Exports of Motor Trucks



bers of American cars and trucks.

Norway and Sweden are increasing in importance as automotive markets. In the former country, in particular, the recent rise of the Norwegian crown to par has had a very good effect upon sales of all commodities. In Sweden, sales continue to be brisk with an added element of competition from the local Volvo car, which seems to be fairly popular with Swedish buyers.

The following items of information have just been released by the Automotive Division, Bureau of Foreign and Domestic Commerce, and are quoted because they are of interest in determining what the future holds for American motor vehicle makers.

The Light & Power Co. of Sao Paulo, Brazil, contemplates an expenditure of some $10,000,000 over a period of five years in improvements of local transportation service. It is proposed to buy 50 buses with necessary garage space for them.

British West Indies now exempts from all import duties automotive products made wholly of British materials by British labor. These items were formerly subject to a 10 per cent duty.

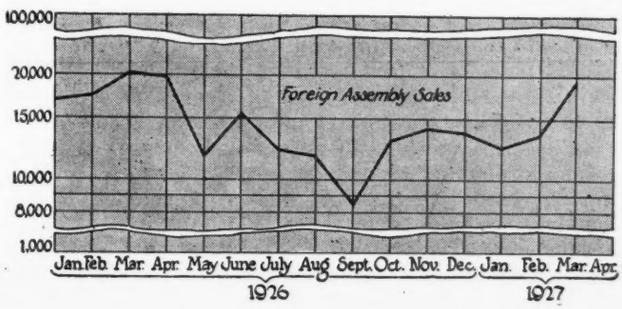
During the first four months of 1927, 364 passenger cars, 37 trucks and 35 motorcycles were imported into Shanghai. Of these, 236 cars, 32 trucks and 15 motorcycles were of U. S. manufacture.

It is reported that the automotive tax has been increased in Yokohoma on an average of 100 per cent.

The automotive business in Great Britain has been very good this year, many distributors of American cars having sold more vehicles than during the same period of 1925 when there was no duty. Increasing use of closed cars and extension of instalment buying are given as reasons for the improved situation.

Futher suspension of duties on automotive imports from Great Britain have been made by the Governor General of Rhodesia so that these British products now enjoy a 50 per cent preference over the general rates.

Foreign Assembly Sales



Most of the competition for American automotive manufacturers is coming from Great Britain and Italy. The former has the advantage of preferential tariff arrangements with its colonies, many of which are of great importance in the world markets for motor vehicles. In Italy, and to a considerable extent in France also, the depreciation of local currency aids the manufacturers to compete with American industry on more even terms than might be possible otherwise.

There has been a noteworthy increase recently in the volume of automobile exports from Great Britain to the Dominions, and some figures on the subject were given in the House of Commons on June 20 by the Parliamentary Secretary to the Department of Overseas Trade. During the first five months of the current year there were exported touring cars, commercial vehicles and chassis to a total of £1,621,313 to Australia, £220,161 to South Africa, £209,817 to New Zealand and £33,138 to Canada, making a total of £2,-084,429. Nearly 70 per cent of the entire business is represented by the export of motor chassis to Australia. As compared with the same period in 1926 the chassis exports to Australia show an increase of approximately 100 per cent.

None of these conditions, however, is of particularly recent origin. They have all been present to some degree at least in years past and American manufacturers have experienced no great difficulty in selling their products in large quantities in spite of the difficulties raised by these conditions. While the product of foreign makers may be improved to more nearly the desires of world buyers and they may lower prices and improve their marketing and servicing methods, these things are just as available to American industry and we are likely to continue to hold our place as the leading purveyor of automotive products to the world.

Certainly there are no indications at present of any change in our position. During the remainder of 1927, at least, export sales should continue at a relatively high rate and it is altogether probable that they will continue to increase for a much longer period than that.

New *Buick* Has Standard *Gear*-Bodies *Are* Lower

Announcement of 1928 line reveals many interesting changes. Engine fitted with spherical cylinder head and new valve mechanism and combustion chambers.

ANNOUNCEMENT of its 1928 line by the Buick Motor Co. reveals numerous refinements in design and equipment rather than radical changes. As far as public interest goes, the adoption of a standard gear-shift in place of the system which has so long been used by Buick probably will command as much attention as anything else.

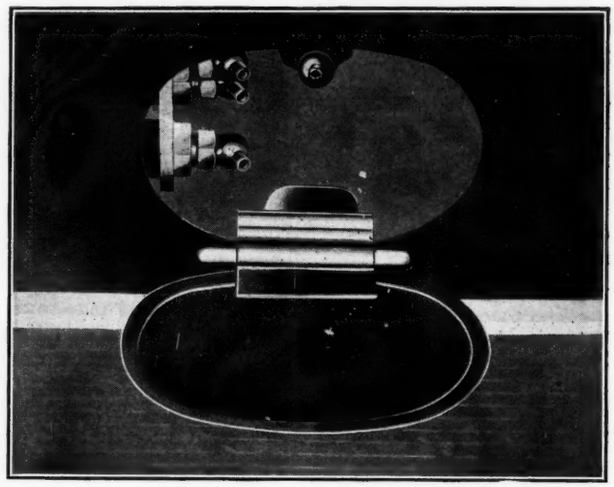
A new type, entirely machined spherical cylinder head, redesigned camshaft and valve mechanism, and increased cooling are principal among developments designed to give better performance.

A double-drop frame, lowering bodies from 2 to 3 in., bullet-type headlamps, sweeping crown fenders, longer bodies, and refinements of interiors lead the changes which have been made to improve appearance. Serviceability has also been increased by making chassis lubrication fittings more accessible, redesigning distributors for greater ease of adjustment, etc.

Prices are practically the same as formerly, with a slight advance for the open models.

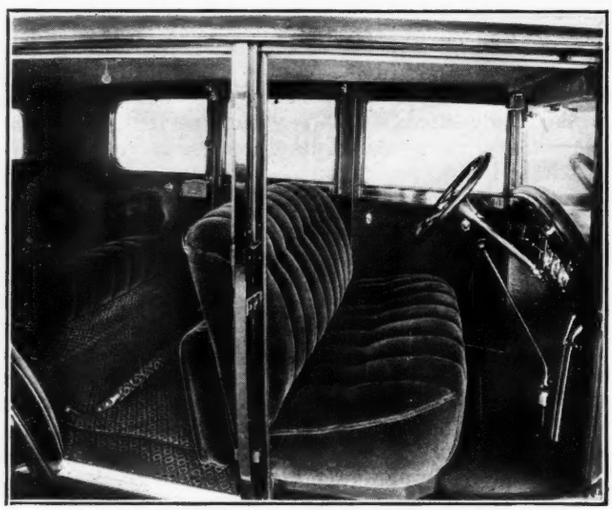
Steering posts on the new cars are adjustable, seats are form-fitting, closed car front pillars are narrower, Lovejoy shock absorbers are standard on all models, open cars have windshields which fold forward, and a variety of improvements and refinements in fittings also have been incorporated in the new line of cars.

Leading changes in the engine are the new valve mechanism and combustion chambers. Cam contours on the camshaft have been changed so as to conform with shortened pushrods, while valves are 7/16 in. shorter on the Series 115 and 5/8 in. shorter on the Series 120 and 128, with valve springs and guides decreased proportionately in length. This change has resulted in a lighter, quieter operating valve mechanism. In addition, No. 1 silchrome exhaust valves of the mushroom type are now used, exhaust valve ports have been increased in cross-section, as has the exhaust pipe, while the muffler is somewhat smaller in diameter and longer than formerly. Inlet now opens at top dead center with exhaust closing 52 deg. after top dead center.



This view shows how the Zerk chassis lubrication fittings have been made more accessible

Completely machined, the new combustion chamber is of spherical design with valve seats slightly recessed and of somewhat higher compression ratio than formerly. The effect of the new head has been to increase the torque available at low speeds, a net increase of 8 and 5 ft. lb. respectively having been attained at 800 and 1200 r.p.m. on the 115-in. wheelbase models, while the 120 and 128-in. wheelbase engine develops 9 and 7 ft. lb. more than last year at these speeds, resulting in quicker acceleration and better hill-climbing at the lower speeds.

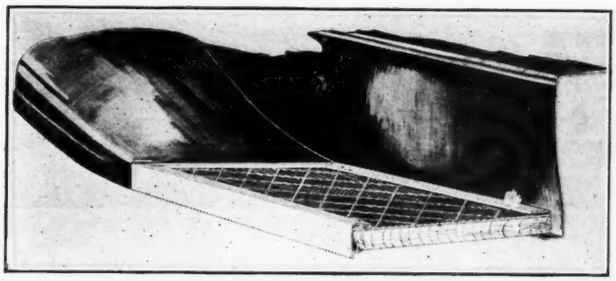


Interior view of the new Buick Series 128 seven-passenger sedan, showing the form-fitting seats. Contrasting colors inside the body are another feature

Shift

By A. F. Denham

Gear ratios in some of the heavier models have also been increased in order to provide greater flexibility. On the 115-in. chassis the sedan and town brougham now have ratios of 5.1 to 1 as against 4.9 to 1 on the lighter models. Sedans and broughams on the 120 and 128-in. wheelbase chassis have gear ratios of 4.9 to 1; other 120 and 128-in. models having a ratio of 4.73 to 1. Tires on the Series 115 are now 31 x 5.25 in., the 120 and 128 Series retaining the 33 x 6.00 tires formerly used on these chassis.

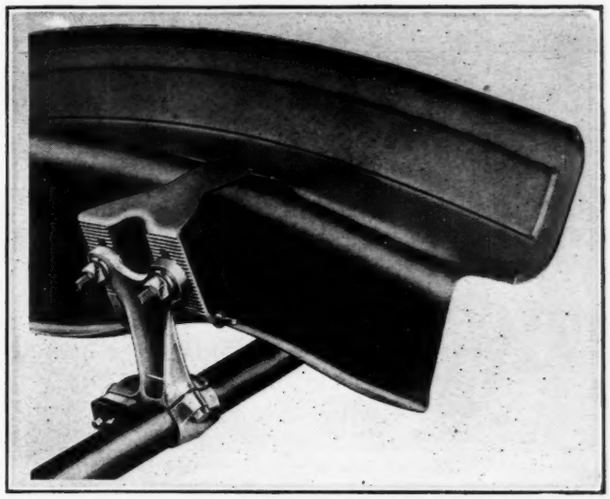


New method of attaching running board binders, eliminating visible screw or nail heads

Better cooling on all models has been accomplished by increasing the radiators in height as well as depth, the 115-in. models having the same radiator frontal area as other chassis. In conjunction with the increase in depth of the radiator, a V-type fan belt has been adopted. A change in the thermostat design has also been made to simplify disassembly for servicing.

To simplify adjustment of the distributor a new type has been incorporated. This distributor can be re-timed by loosening a lock bolt, lifting and turning the head. Spark gap adjustment is by loosening two screws which hold down the arm carrying one of the points, when this point can be shifted, the holding screws passing through oval holes in the arm. As formerly, the electrical system is of Delco-Remy manufacture. With the adoption of a combination ignition and steering gear lock on the steering column, the ignition circuit breaker is mounted back of the dash.

Other changes in the electrical system include the use of thermostatic charging control for the generator and higher gear-



Rear view of instrument panel of new Buick, showing adjustable steering wheel column bracket

ratio for the starter mechanism. The starter is now equipped with a grounding strap since rubber engine supports are used.

Changing over to an S.A.E standard shift has been accomplished simply by reversing the forks, gear ratios and gears remaining practically identical with those used on former models. The new transmission has been so designed that it can be used for service replacement in former Buick cars, although the former Buick shift cannot be used in the 1928 models due to a change in the emergency lever mounting and linkage, the lever now being mounted on the side of the gearcase instead of integral with the cover. This was necessary due to a lowering of the frame.

Propeller shafts are still of the torque-tube type, the major change being in relocating the radius rods, which now attach to the tube back of the fourth cross-members (third on the 115 in. models) instead of immediately back of the transmission case as formerly. The rear ends of these radius rods have also been moved in somewhat from the axle ends and are attached to forged brackets on the axle housing, where they are more accessible in case of need of adjustment.

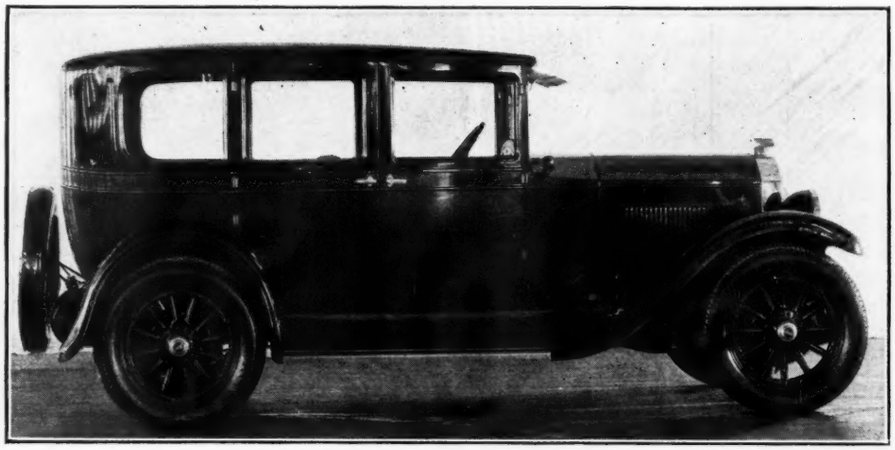
A standardized axle has been developed for the Series 120 and 128, identical except for propeller tube length. Differential gears, moreover, are interchangeable between these chassis, as are differential bearings. Other changes in the rear axles include a new type of anchor pin for the differential pinion shafts. This pin is larger in diameter than before and locks the shafts by means of a grove in the shaft side rather than through a drilled

129 Buick Body Models

FOLLOWING is a complete list of body models offered by Buick for 1928, with the prices:

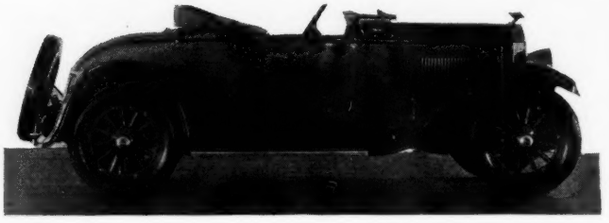
Body Model	Price
Series 115	
5-p. 2-door sedan	$1,195
2-4-p. de luxe roadster	1,195
5-p. " touring	1,225
2-p. coupe	1,195
4-p. country club coupe	1,275
5-p. 4-door sedan	1,295
5-p. town brougham	1,375
Series 120	
5-p. sedan	$1,495
5-p. town brougham *	1,575
4-p. coupe	1,465
Series 128	
2-4-p. de luxe sport roadster	$1,495
5-p. de luxe sport touring	1,525
4-p. country club coupe	1,765
5-p. coupe	1,850
5-p. brougham	1,925
7-p. sedan	1,995

* New model.



Left—Lower bodies, sweeping fenders, and bullet-shaped head and cowl-lights characterize the new Buick models. This five-passenger sedan on the Series 115 chassis is typical of the line

Below—Open Buick models of the 1928 line have forward folding windshield. Note that mirror is effective with windshiled down. This Series 115 roadster has a bell-crank on the rear top support to shorten it in the folded position. All rumble seats are fitted with arm-rests



hole as was customary in previous Buick models.

A forged boss for attachment of the Lovejoy shock absorbers is the main change on the front axle. Brakes are practically identical with those used on former models, the major changes made, all in the linkage, being required by the decreased clearance between the lower frame and the running gear. An adjustable column is the major change in the steering gear. This adjustment is obtained through the use of toothed interlocking brackets on the steering column and the dash, with an elongated bolt hole in the bracket on the dash, providing a total movement of 1½ in.

Frames Entirely New

Frames are of entirely new design. While the stock is somewhat lighter than formerly (now 9/64 in.) strength has been increased through the use of wider flanges and a rolled-over lower flange on the side members. Side channel depth on the Series 115 has been increased ½ in. to 6½ in., and the curved lower flange is 1⅜ in. wider than formerly. On the Series 120 and 128, side channel depth is now 7 in., 9/16 in. more than formerly, and the flange width has been increased 15/16 in. to 2 15/16 in. A heavier front cross-member is also used, and following former practice, all cross-members are provided with flanges widening out to take the place of gusset plates.

With a lowering of bodies of 2 in. on the Series 115 and 3 in. on the Series 120 and 128, due to the double-drop construction adopted in the frame, overall height of the closed cars now ranges from 70 to 72 in. Other changes in the frame include the use of brackets integral with the outside of side-members for the front body bolts and the rear hood hold-down clamps. The rear cross-member, which formerly was located opposite the spring hangers, has also been moved further back.

While the major dimensions of the springs, including spring eyes, have been retained, they are lighter and have been redesigned for use with the shock absorbers now standard. An interesting feature from a servicing angle is that all Zerk pressure gun chassis lubrication fittings are now accessible without the necessity of reaching under the car. This has been done by piping such points needing lubrication to accessible points. Five such fittings are clustered beneath the running board apron on either side, where they are reached through a small hinged door in the apron.

By lowering the bodies, raising the radiator, adopting heavier, more sweeping crown fenders, and eliminating the vertical molding at either side of the rear body panel, body lines have been materially improved. New two-tone color schemes are also used, while bullet-type cowl and Tilt-Ray headlamps carry out the lines. On some of the models these are nickeled completely while on others they have a wide nickel band and black body to harmonize with fenders.

Special attention has been given to the interior finish of the new cars. Contrasting color schemes are used inside as well as out. The color of the plush mohair is set off by using different colors for each wall ceiling covering, and carpets. Seats in all models are of the form-fitting type. All sedans as well as rumble seats are fitted with arm rests for the rear seat. These models also have covered footrests in the rear compartments.

A new instrument panel of attractive design has been adopted. All switches has been removed from the instrument board face. Headlight control as well as the usual spark and throttle controls, are by levers on the steering wheel. The ignition lock is incorporated in the steering gear lock. These two locks are semi-independent, since the ignition can be shut off without locking the wheel, but the wheel cannot be locked without shutting off the ignition.

New Type of Sun-Visor

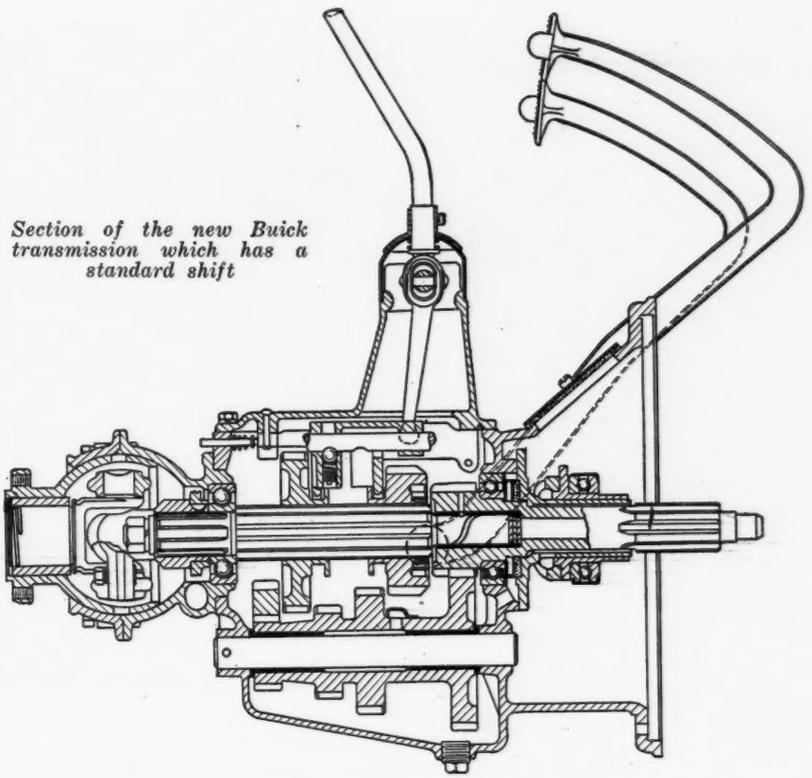
A double-throw toggle switch is mounted under and just in back of the instrument board, controlling the indirect lighting for the instrument panel and a light mounted out of sight above the panel which furnishes illumination for the interior of the front compartment, including the steering gear lock. Dome lights are controlled either by opening and shutting the rear compartment doors on the sedans, or by the switch placed on the right middle pillar. As mentioned, front body pillars are of the clear vision type and of composite construction. By decreasing the depth of the top windshield panel additional vision has been obtained. A new type of sun-visor with nickel plated mounting brackets is used.

Two of the new Buick models have adjustable driver's seats, the five-passenger, two-door sedan and the five-passenger coupe of the Series 128. Total adjustment is 2 in. A new style of top material, rubberized, and washable, is used on the sports models. Open models have forward-folding windshields. The panel between the bottom of the windshield and the cowl also has glass inserts on each side of the cowl curve. The folding posts of these windshields are drilled for the air-duct to the windshield wiper. A locking tool compartment is incorporated in the left front door by means of a panel hinged at the bottom, and the five-passenger de luxe touring of the Series of 128.

A combination stop, backing and tail light is now used. A single lamp is used for either backing or stopping, the first being controlled by the shifting of the reverse gear, the latter by the usual foot brake pedal action. The switch for this light is mounted on the rear of the transmission cover.

A new idea is also found in the running board trim, in which screw heads are not visible. This is accomplished by placing a steel binder strip carrying the screws below the trim. The metal trim has a turned-over edge which catches below this binder strip, and is tacked on from below the running board.

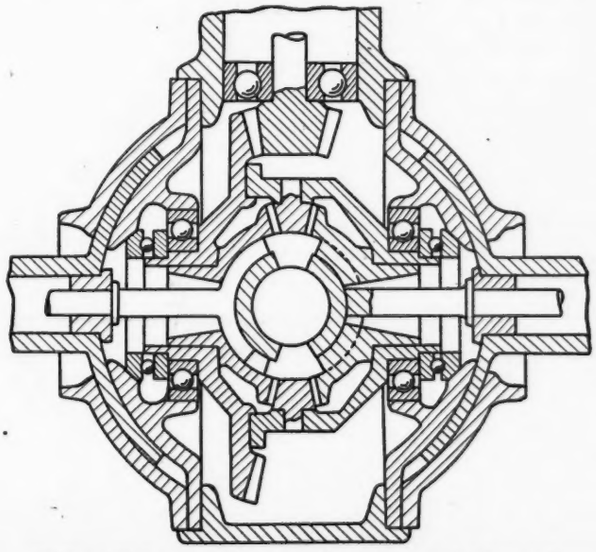
Standard equipment on all models includes automatic windshield wiper, dash gasoline gage and dash engine thermometer, rear vision mirror, Lovejoy shock absorbers, smoking and vanity cases on sedans, wood wheels, cigar lighter on de luxe models, rear traffic signal. Special equipment offered through Buick dealers includes trunk rack, mountable on any model, front fender wells for carrying tires on running board, exhaust heater, wire wheels, and bumpers.



Section of the new Buick transmission which has a standard shift

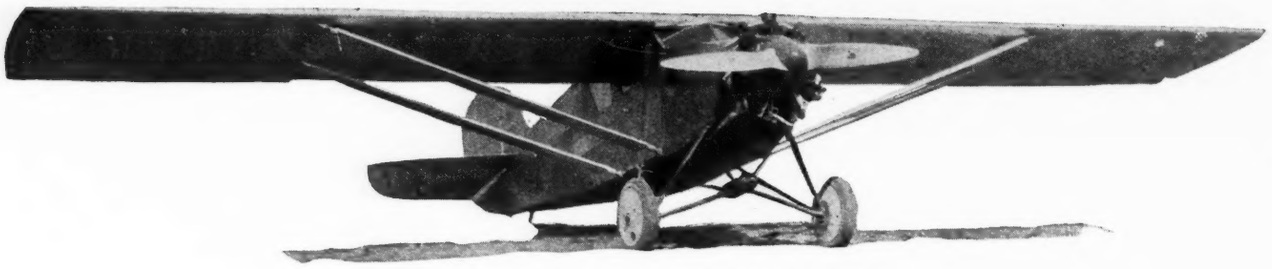
Austrian Car Builder Patents Swinging Rear Axle

SEVERAL makers of passenger cars in Europe arrange their rear axles so that each half can swing independent of the other half. This permits of mounting the differential housing on the frame and reduces the unsprung weight, thereby improving the riding qualities. One car that has its rear axle arranged in this manner is the Austrian Steyr and a patent on the arrangement has been published recently.



Differential and drive gear for Steyr swinging axle

It will be noticed from the drawing that the housing for each of the axle shafts at its inner end has a flange forming a zone of a spherical shell, which is located between two similar shells forming part of the differential or rear axle center housing. Within the inner of the last mentioned shells the differential gear is shown supported in ball bearings. Drive gear and differential are of the usual type and the novelty resides in the driving connection between the differential side gears and the axle shafts. Instead of being rigidly connected to the axle shaft by means of keyed or splined joints, as in the conventional axle, the differential side gears are connected to these shafts through universal joints of peculiar construction. Each joint comprises three members, viz.: the differential side gear, the forked end of the axle shaft, and an intermediate piece. The latter is formed with what are described as annular grooves at right angles to each other, which may be either on the same or on opposite sides. In one of these grooves are located spline-shaped projections on the inner surfaces of the differential side gears, while in the other are located the prongs at the inner end of the axle shaft. All of the spherical surfaces have a common center coinciding with the center of the differential gear.



Stimson monoplane, winner of 1927 Air Tour

Air Tour Proves Superiority of Cabin-Type *Plane*

Enclosed ships carry heavier contest loads than open types and speeds are comparable. Stinson's monoplane wins.

BY piling up a point score lead of practically 2000 points over his nearest competitor, Eddie Stinson, piloting his latest type ship, a monoplane developed from the Stinson-Detroiter biplane, and owned by the Wayco Oil Co., won this year's National Reliability Air Tour.

His total score of 9853.7 points represents 96.4 per cent perfect performance over the entire route, composed of 25 legs and totaling 4169 miles. His high score was achieved by a plane design which enabled him to carry a higher contest load per horsepower than any other contestant entered. At one time during the tour Stinson was some 4000 points ahead of his nearest competitor.

Second place went to the new Hamilton all-metal monoplane, with a total point score of 7863.5, with the Mercury, Ford transport, and the Waco "10" piloted by John Wood following in close order.

An interesting feature in connection with the tour is that not a single one of the 14 starters was actually forced out of the tour, although all kinds of weather conditions, including fog and rain and strong headwinds, and muddy or poor landing fields were encountered. Thirteen of the planes reached Detroit on July 12, one having dropped out at Oklahoma City, the home town of the owner-pilot.

Eddie Stinson carried as his passengers over the entire route, F. Schlee, president of the Wayco Oil Co., Mrs. Schlee, and their young daughter, the first time that an entire family has ever participated in a tour of this type or length.

Troubles experienced during the tour were all minor in character. There were some tail-skid and undercarriage breakage due to poor or muddy landing fields. Plane troubles were practically nil, while engine troubles were confined chiefly to valves and valve-springs.

If the tour did nothing else it clearly demonstrated that the modern cabin-type plane is the equal economically and commercially, if not the superior, of its open cockpit prototype. Contest loads carried in the cabin planes ranged from 5 to 7½ lb. per hp. while the open cockpit types carried from 2½ to 4½ lb. per hp. Comparing the two types on the basis of maximum speed, there is no radical difference. Open cockpit types entered in the tour had maximum speeds ranging from 93.1 to 130.2 m. p. h. while the cabin types will show variations of from 112.3 to 124.3.

The formula used in the tour for computing scores shows further the superiority of the cabin type. The formula is:

$$\frac{\text{(Contest load) x (Maximum speed*) x 50}}{\text{(Take off time plus landing run time) x Piston displacement.}}$$

*Note—Provided 85 per cent maximum speed is maintained. Otherwise use actual m.p.h.

According to the formula, the most efficient plane in the tour was the Stinson. The improvement obtained in the Stinson-Detroiter in changing from a biplane to a monoplane type of construction is quite marked, although but little has been done to the ship, aside from using the monoplane wing, and lengthening out the fuselage slightly.

Comparing the ship with a standard Stinson-Detroiter biplane also entered in the tour, and powered with the same type engine, a Wright Whirlwind (J-5) of 200 hp., an increase in load of from 1000 to 1500 lb. is achieved, while the maximum speed has been increased from 116.7 to 124.3 m. p. h.

The new plane is a high lift section, high wing type monoplane of similar construction to the types which have recently made transoceanic history, as exemplified by the Wright-Bellanca, Ryan and others. The wing is braced from the bottom of the fuselage by means of two-air foil inclined struts, and is of wood and steel construction, fabric covered. A divided type axle with a single shock absorber unit at the top of the V and Sauzedde wheel brakes have been incorporated in this plane, which has a seven-passenger cabin. Gas tanks are mounted in the wing center section, with gravity feed

to the engine. A standard steel propeller with the usual adjustable pitch is used, while other features include balanced rudder and dual control. The fuselage follows closely on the design of the regular Stinson-Detroiter and is of the steel tube type, fabric and metal covered.

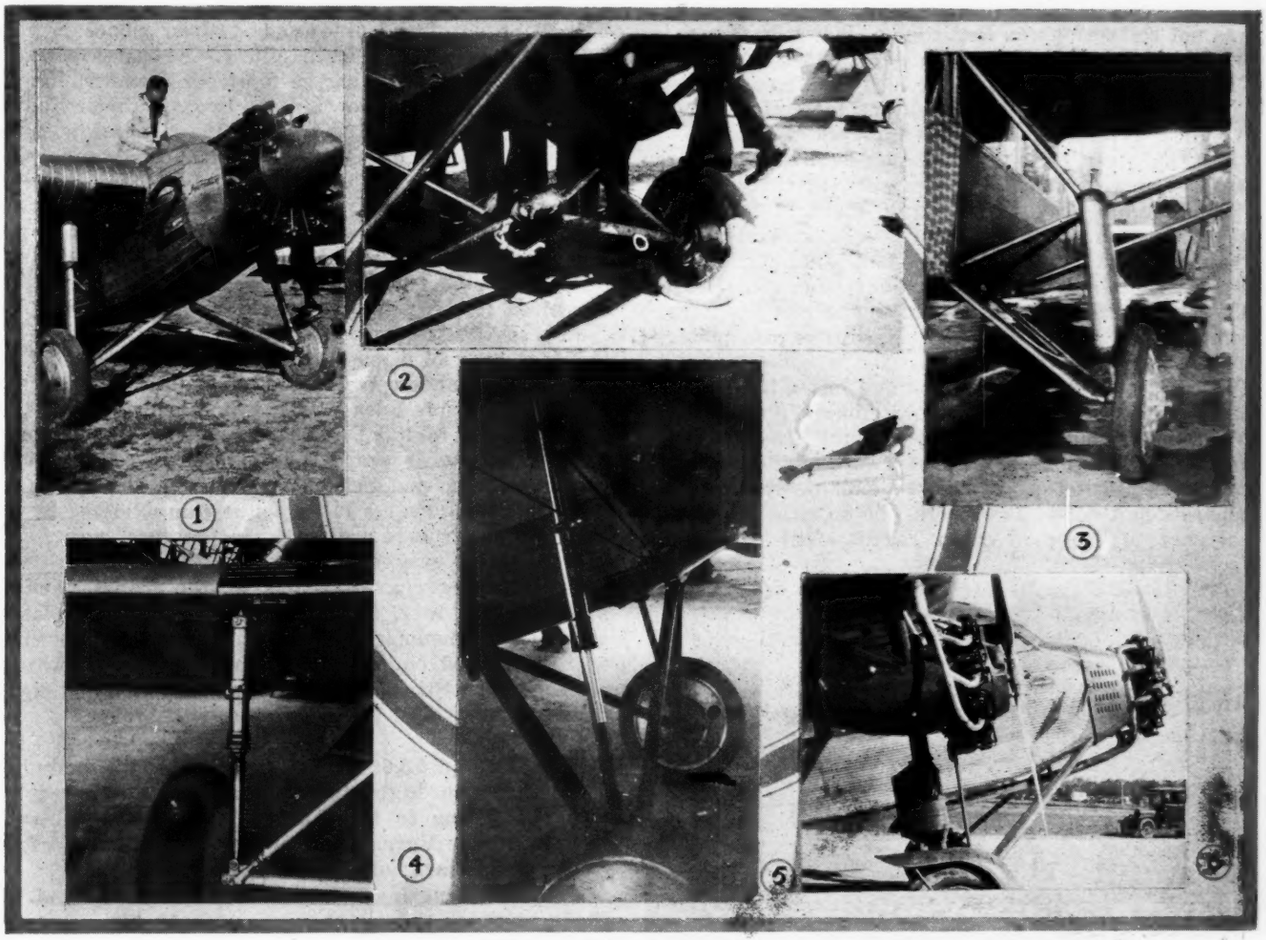
Another interesting plane in this year's tour was the Hamilton all-metal monoplane. While the general design is quite similar to that used in the Ford-Stout all-metal planes, in a smaller edition, the cabin arrangement is novel. The wing is quite thick at the center-section, the top being flush with the top of the fuselage. In order to build a cabin into this ship, it was necessary to use a part of the under wing surface for windows, while entrance into the cabin requires the swinging back of a part of the under wing-surface integral with the door. The cabin is arranged for five passengers, and the pilot's compartment is of the open-cockpit type on top of the fuselage just ahead of the wing. The plane is powered with a Wright J-5 air-cooled 200 hp. engine and has an unusually short run on landing, assistance toward this end being furnished by the Sauzedde brakes incorporated in the wheels and the extremely low center of gravity with the plane on the ground, enabling a more rapid application of the brakes without danger of nosing over.

The all-metal wing of the Hamilton plane is tapered in both cross-sectional directions from fuselage to wing tip. All control surfaces as well as the fuselage are also covered with sheet duralumin, the rudder being quite large and rectangular in shap while the stabilizer is adjustable in flight. A built-up channel section, steerable tail-skid is used on this plane. Undercarriage is of the split-axle type, with braces to the wing near the fuselage and shock absorber units mounted on each strut just below the wing. The Hamilton plane carried a contest load of 1200 lb., representing 6 lb. per hp. Its top speed is 112.3 m. p. h.

A New Pitcairn Plane

Another new type of plane, this one of the open cockpit type, was the Pitcairn PA-5 mailplane, a development of the PA-4. It is designed for use on the New York-Atlanta mail route, contract for which has been awarded to Pitcairn. This plane is a more or less conventional single seater, single-bay biplane with the lower wing slightly shorter, fabric covered and staggered. Following usual Pitcairn construction, the fuselage is of the steel-tube type, fabric covered. The mail compartment is ahead of the pilot's cockpit. A balanced rudder, stabilizer adjustable in flight and differential aileron control in the lower wing only are embodied. A standard steel propeller is used and provision is made for brakes, although these were not used on the tour as a slight modification of the undercarriage,

Different Types *of* Shock Absorbers on *Air Tour* Planes



1. Mounting of the shock absorber on the Hamilton all-metal plane. 2. The type of unit that is most widely used. In this case it is mounted on a Buhl Airsedan. Note wheel brakes. 3. One of the two units used on the Ryan cabin monoplane. 4. Aerol Strut type pneumatic shock absorber. 5. Another type of Aerol Strut as used on Waco "10" ships. 6. New Ford transport has two units of this type

Characteristics of Planes in 1927 Air Tour

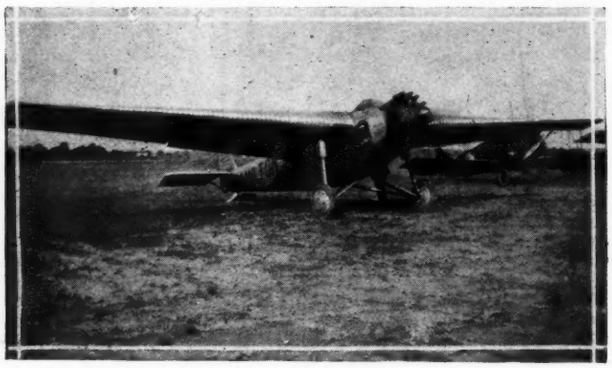
Plane No.	Plane Make	Plane Type	Engine Make	Cooled by	Total hp.	Cabin or Open	Brakes Used?	Land. Run Time (Secs.)	Take Off Time (Secs.)	Max. Speed	Contest Load	Points for Perfect Performance
1	Buhl Airsedan	Biplane	Wright J-5	Air	200	Cabin	Yes	10.83	15.97	115.0	1000	272.6
2	Hamilton	Monoplane	Wright J-5	Air	200	Cabin	Yes	5.93	16.83	112.3	1200	376.2
3	Alex. Eaglerock	Biplane	Wright J-5	Air	200	Open	Yes	7.97	9.96	130.2	500	230.7
4	Alex. Eaglerock	Biplane	Curtiss OX5	Water	90	Open	No	10.17	16.0	93.1	400	141.5
6	Pitcairn PA5	Biplane	Wright J5	Air	200	Open	No	13.0	10.45	127.8	570	197 4
7	Mercury MW3	Biplane	Curtiss C6A	Water	160	Open	Yes	7.37	15.5	122.8	700	228.6
8	Waco 10	Biplane	Wright E-4	Water	180	Open	No	10.83	10.8	11.5	450	161.2
10	Waco 10	Biplane	Wright J5	Air	200	Open	Yes	9.33	10.47	119.1	600	229.3
11	Waco 10	Biplane	Wright J5	Air	200	Open	Yes	7.0	11.0	120.3	650	276.
12	Waco 10	Biplane	Wright J5	Air	200	Open	Yes	8.83	11.0	115.6	656	243.0
13	Stinson-Detroiter	Biplane	Wright J4	Air	200	Cabin	Yes	10.3	18.13	116.7	1000	260.8
22	Ryan	Monoplane	Wright J5C	Air	200	Cabin	No	15.43	16.3	124.0	1000	248.3
23	Ford Trimotor*	Monoplane	2-Wright J5	Air	400	Cabin	Yes	.....	.....	.....	....	323.8
			1-P & W Wasp	Air	400	.....	...	.....	.....	.....	....	.....
24	Stinson	Monoplane	Wright J-5	Air	200	Cabin	Yes	12.13	17.0	124.3	1500	406.6

which is of the rigid axle type, was found necessary.

According to the preliminary tests, the fastest ship in the tour was the Alexander Eaglerock with Wright Whirlwind engine, this plane having a top speed of 130.2 m. p. h. The ship, except for the addition of brakes, use of a divided-axle type undercarriage, and the higher powered engine, does not differ greatly from former Eaglerock models. This plane carried a contest load of 500 lb., representing 2½ lb. per hp.

One of the latest type of Ford tri-motor ships, a Navy Transport, also participated in the tour, although it was not competing for the trophy. Power has been increased in this plane through the substitution of a Pratt & Whitney Wasp air-cooled 400 hp. engine in the nose for the 200 Wright engine formerly used, the Wright J type wing engines being retained.

Of the other cabin type airplanes in the tour, the Ryan ship was identical in design with that built for Colonel Lindbergh's transatlantic flight. It is similar in construction to the Ryan M-2 used on western mail routes, although the front part of the fuselage has been redesigned to incorporate the cabin type of construction. The pilot in this ship is seated in the main passenger compartment at the front. This ship is also powered with a Wright Whirlwind, carried a contest load of 1000 lb., equal to 5 lb. per hp., and has a top speed of 124.0 m. p. h. according to the preliminary tests. Plane No. 1 in the tour was a standard Buhl Airsedan cabin. In this ship the pilot is seated forward of the main passenger cabin, his compartment being provided with a separate exit door. Two doors, one on either side, give entrance to the main cabin, seating four passengers.



Hamilton all-metal monoplane which took second place in the Air Tour

Divided axle landing gear, mechanical brakes and compression type shock absorbers are part of the equipment of this plane.

Represented by the largest number of entries the Advance Aircraft Co. entered four of its Waco "10" planes. Three of these ships are powered with Wright Whirlwinds, while the fourth has a water-cooled Wright E-4 engine, developing 180 hp. against 200 in the other planes. The 20 extra horsepower in the Whirlwind-engined ships probably are largely responsible for the 150 to 200 lb. of additional contest loads carried in the latter. Speed of the air-cooled engined planes is also from 4 to 9 m.p.h. higher in spite of the increased load.

An even more striking gain in performance due to modern engines was shown by the two Alexander Eaglerock planes entered in the tour. One of these is powered with a war-time Curtiss OX-5, 90 hp. engine, the other with Wright Whirlwind 200 hp. motor. While the former was slated to carry a 100 lb. less contest load, the latter had a top speed of 130.2 m.p.h., as against only 93.1 for the OX-engined plane.

The best performance of the open cockpit type planes, according to the formula used in computing points, is shown by the Mercury MW-3, powered with a Curtiss C-6-A water-cooled engine developing 160 hp. at 1750. This ship, a tandem two-seater, single-bay biplane carried 700 lb. contest load, with which load it had a top speed of 122.8 m. p. h. Fuselage is of steel tube, fabric covered, wings are of wood and metal construction, fabric covered, and brakes are used on the split-axle type of landing gear. The plane is characterized by an unusually large gap, a dihedral in the lower wing, and a considerable stagger.

Summarizing characteristics of the planes participating in the tour, it is found that 10 were biplanes against four monoplanes. Eleven planes were powered with air-cooled engines as against three with water-cooled types. Six planes had inclosed cabins, and eight open cockpits. Ten were equipped with brakes.

MORE than 13,600 miles of earth roads included in State highway systems were surfaced in 1926, according to information compiled from State reports by the Bureau of Public Roads of the United States Department of Agriculture.

The total length of surfaced roads constructed by State agencies during the year was 19,492 miles, of which 13,664 miles was laid over former earth roads and 5828 miles represented a rebuilding of old surfaces.

Just Among Ourselves

Hot Weather Makes Car More Desirable

DISCOURSING about automotive subjects isn't so easy this week, since we have just returned from a ten-day vacation—and so much can happen in ten days automotively speaking. If the hot weather that prevailed up in the mountains where we were has been at all general—and the newspapers tell us that is has—lots more people probably have been wanting automobiles worse than ever and those who already have them probably have been wearing out their old ones at a faster rate than during any similar period since the first of the year. We were pleased on this trip to find at least two small towns in which the speed limit is announced as 20 m.p.h., which is some progress at least over the 12 and 15 m.p.h. signs which are so ridiculously common. We took occasion to try out again some of the ideas about backroad and secondary road driving propounded a few months ago and can report that we still think the idea has possibilities both from a standpoint of facilitating traffic on the main roads and increasing the enjoyment of individual motorists. Any general campaign to encourage secondary road travel would naturally be frowned upon by those owners of secluded farms who already have been pushed many miles from the cities in search of a quiet isolation—and they couldn't be blamed for their sentiments. Yet the idea does seem to have merits as a traffic-expediting agency and, consequently, as a means of further promoting automobile travel and automobile sales.

* * *

We Are Intolerant of the Unfamiliar

DELVING a bit further into Cabell's books during our absence from the office, our thoughts were returned to the matter of tolerance and mental flexibility again by a few lines in "Beyond Life." The question assumes greater importance always as tendencies toward wage declines or industrial readjustments bring forward a bit more strongly again matters of industrial relations in the various automotive plants, while the attitude of executives toward their everyday problems and relations with other departments always are influenced strongly by varying degrees of mental flexibility. Having talked about the subject before we are constrained to quote the following line from Cabell for what it is worth: "We are all of us, as if by instinct, intolerant of that which is unfamiliar; we resent its impudence."

* * *

A Banker's Idea of Credit and Repossessions

A NEW YORK banker last week, it is interesting to note, suggested that if automobile manufacturers would have fewer and financially stronger dealers and then let them have part of their quota on consignment, finance companies could have more time to make complete investigations before granting credit and thus have fewer repossessions, the idea being that these better financed dealers with some cars shipped to them on credit would themselves handle any financing that had to be done in a great hurry in order to complete a sale. This procedure, suggested by O. F. Meredith, assistant vice-president, Bank of America, might cut down the finance companies repossessions, but, so far as we can see, would not reduce repossessions as a whole, nor, indeed, affect them one way or the other. If there isn't time for the finance company to investigate, probably their isn't time for the dealer to investigate either— and the fact that the dealer had cars on open account wouldn't encourage him to investigate any more carefully than if he already had paid for them or financed them himself, as he does at present.

* * *

Believes Situation is Materially Better

MR. MEREDITH does believe, however, according to his talk made before the credits conference of the American Institute of Banking in Detroit last week, that within the last year "the situation is materially better and continuing to improve." He said that "Perhaps there have been too many finance companies, which for a short time found it easy to grow by their own terms. Within the past year, however, conditions have changed, and you heard of very few new companies forming, but you did hear of sales, consolidations and liquidations. Finance companies with adequate capital, officered by men of excellent character and ability are in about the same position as the average bank, and fewer companies, in my opinion, mean better control of the dealer problem as well as safer terms." Coming from such a source, the foregoing offers a distinctly encouraging support to corroborate the general opinion of automotive men regarding current trends in the retail financing situation.

* * *

Aviation Still Breaking Records

STILL more profits of the technical achievements of the aviation industry continue to be presented for public consumption. The record-breaking flight to Hawaii by Smith and Bronte provided last week's addition to the list. Dangers as well as possibilities of air travel have been brought home by the experiences of the recent flights, but the latter have overshadowed the former.

—N.G.S.

How *to* Adapt *Third-Brush* Generator *for* Reverse Rotation

Principle on which control by third-brush system operates is that of armature reaction. Output increased when third brush moves in direction of rotation.

By P. M. Heldt

ALTHOUGH the third-brush system of control for battery-charging generators is widely used, some of its features are not as well understood as they might be. This applies to the changes which are necessary when it is desired to adapt a third-brush generator for the reverse direction of rotation. Of course, it is not often that a generator has to be fitted to a machine on which it will have to revolve in the opposite direction from that for which it was designed, but the problem arises occasionally.

Fig. 1 herewith shows the electrical connections of a typical third-brush motor vehicle generator. The armature has a so called wave winding, so that, although the field has four poles, only two main brushes are required. These two brushes, of course, are placed at points of maximum potential difference on the commutator, which points are 90 deg. apart. The third brush can be placed somewhere between the two main brushes, so that the difference of potential between it and the trailing main brush is only a fraction of that between the two main brushes. In practice it is preferable to place the third brush on the opposite side of the commutator, as there is more room for it there and consequently, it is there more accessible. Any two diametrically opposite points on the commutator of a four-pole generator with wave winding are of the same voltage or potential.

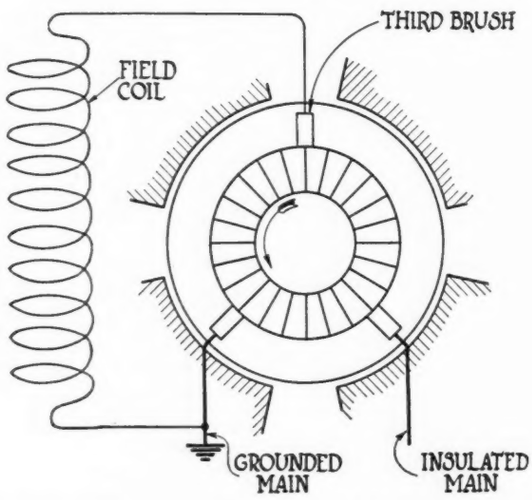


Fig. 1. Diagram of connections of four-pole charging generator with wave-type armature winding and third-brush control

In a third-brush controlled generator the field winding is connected between the third brush and one of the main brushes. Those familiar with this system know that in a two-pole generator the main brush to which the field winding is connected is the trailing one; that is, the one behind the third brush with respect to the direction of rotation. For the benefit of those not so familiar with the system it may be well to explain the reason for this.

The principle on which control by the third-brush system operates is that of armature reaction. When the engine speed increases and the generator speed with it, the natural tendency is for the voltage generated in the armature to increase, for the armature voltage is a function of the magnetic flux, the number of armature windings and the speed of revolution. Any such increase in armature voltage results in an increase in the current flowing through the armature and through the charging circuit. This increase in armature current has to be depended upon to counteract the effect of the increase in speed, so that a considerable increase in speed will result in only a small increase in voltage. The way this is accomplished may be seen by reference to Fig 2.

Variation in Voltage

The wave-shaped curve shown in this figure represents the variation in voltage over a portion of the circumference of the armature corresponding to a pair of adjacent field poles. In a two-pole generator, for instance, it would correspond to the entire circumference of the armature. The locations of the main brushes are indicated by B, B1, and it will be seen that these are the points of maximum difference of potential, because the vertical distance of the curve from the base line represents difference of potential. The locations of these points on the circumference of the armature depend upon the flow of magnetism from the field frame into and out of the armature core.

When very little current is being delivered by the generator, what is known as the axis of commutation, on which the brushes must be placed for sparkless commutation, depends only on the field magnets. But when an appreciable current flows through the armature, this current sets up a cross magnetic field, that is, a magnetic field which in a two-pole machine will be at right angles to the magnetic field set up by the field coils. This cross field combines with the main field, which results in a shifting of the direction of the resultant field and of the axis of commutation. Shifting of the axis of commutation must have the

result that the potential difference between the two brushes to which the shunt field winding is connected is decreased, so that less current will flow through the field coil and the influence on the armature voltage of an increase in speed is thus neutralized by an accompanying decrease in field current.

In Fig. 2 the third brush is indicated by *b*, and the direction of motion of the armature by the arrow. Now assume that, as a result of current flowing in the armature, the voltage wave is displaced in the direction of armature motion until it occupies the position indicated by the dotted line. The brushes not being shifted, they now bear on the commutator at points of different voltage, B' and b', and it will be seen that the difference in level between these two points, d, which represents the potential difference between them, is much less than that (D) between the former positions of brushes, B and b. Hence, since there is less potential difference between the two brushes to which the field coils are connected, less current will flow through these coils, the magnetic strength of the field decreases and this in turn keeps down the voltage generated in the armature. Therefore, regulation of the armature voltage and charging current will be effected if the field coil is connected to the third brush and the brush trailing behind it, if the third brush is located between the two main brushes; or to the main brush leading it if the third brush is located opposite the main brushes.

In Reverse Direction

Now suppose it is desired to run the generator in the opposite direction. Naturally, since the residual magnetism is the same, if the armature revolves in the reverse direction, it will generate a voltage in the reverse direction and current will flow through it in the reverse direction. Therefore, in order that the current may flow through the battery in the proper direction we interchange the connections of the main brushes.

Since it is the object of the field coil to build up the field from the residual magnetism, it is, of course, necessary that the current flow through the field coil in the same direction as previously, and since the polarity of the two main brushes has been changed, it is necessary also to transfer the connection of the field coil from the main brush to which it was fastened originally, to the other main brush. We then have the connections shown in Fig. 3, and it will readily be seen that when the axis of commutation is shifted by the armature current, it shifts in such a way (in the direction of armature rotation) that the potential difference between the two brushes to which the field coils are connected decreases, which is as it should be.

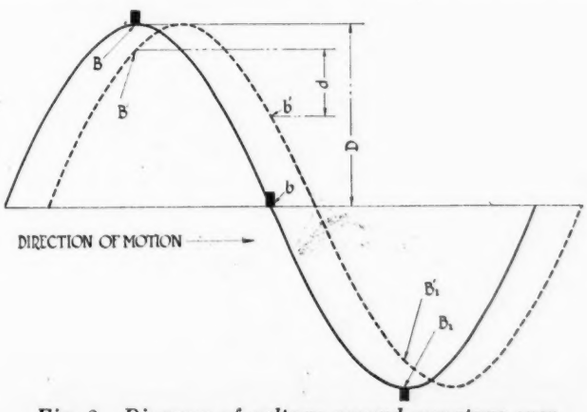


Fig. 2. Diagram of voltage around armature over a section corresponding to one pair of field poles

In the diagrams we have indicated the third brush as located midway between the other two brushes, and if that were its exact position the generating characteristics would not be affected by the reversal of motion of the armature, provided the whole brush rigging were adjusted to have the same lead for the new direction of rotation as it had for the old. Ordinarily the third brush is not located midway between the two main brushes. electrically speaking, and the question then arises whether it has sufficient range of individual adjustment to bring it into the same relation to the main brush from which the field current is taken as it was to the other main brush—from which the field current was then taken—in the first place. If this can be done the generator can be satisfactorily reversed.

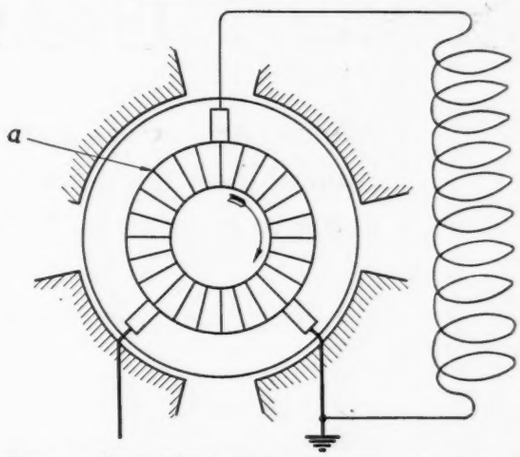


Fig. 3. Connections of the generator for the reverse direction of rotation

In a three-brush generator the output is always increased when the third brush is moved in the direction of rotation by adjusting its brush holder. In Fig. 3 there is a point *a* on the commutator, directly opposite the point at which the grounded brush bears, which is of the same potential as this latter point. It is the voltage generated in the coils between point *a* and the third brush which determines the field current. By moving the third brush farther away from point *a* the voltage applied to the field coil is increased, the voltage generated is increased, and hence the current output of the generator is increased.

Gas Generator Problems

WRITING upon the present status of gas generators on motor trucks and other vehicles in *Le Poids Lourd*, M. J. Jagerschmidt, French Inspector-General of Streams and Forests, says the troubles at first experienced with producer gas, such as fouling of the engine and loss of time in getting started and at the completion of a trip, due to attention required by the generator, have been eliminated. The processes of gas purification are now sufficiently effective so that the care of the powerplant is no more troublesome than with a gasoline engine; it does not take more than 5 or 6 minutes to get the engine started in the morning, and the weight of the generator has been reduced to about 660 lb. and in some cases even to 330 lb., which is not excessive for a delivery wagon and negligible for a large truck. There is only one remaining difficulty, and that is the loss of power, and this problem now chiefly engages the manufacturers.

Study *of* Trade Buying Habits *in*

Motor car dealers, garages and repair shops are getting bulk of their supplies within 50 miles of home instead of going to big cities. Trend important to manufacturers.

By David Beecroft

BUYING habits of motor car dealers, garages and repair shops have been very extensively modified in the last five years. Changes in these habits have been largely dictated by the urge from vehicle owners who demand a different measure of attention than in years gone by, and further by the changed business conditions, in which volume of business is increased but net profits decreased.

The urge of the vehicle owner, for a different measure of attention, has arisen from two sets of basic conditions:

1. The motor vehicle—a privately owned passenger car or a business vehicle—has become so imperatively necessary in all departments of life and business that there is an unprecedented need today for quicker attention in the nature of service of all kinds than heretofore. The vehicle is nearly as essential, in the everyday life of the family, as the kitchen stove.

2. With 48 per cent of the motor vehicles owned in places of 5000 population or less, and in the rural areas adjacent thereto, repair work of a complete character must be as quickly and adequately done in these places as in the city; and so replacement parts, accessories and all products needed in the maintenance and operation of motor vehicles must be almost immediately available to cross-roads as well as in the larger centers.

The small town, or even cross-road, is no longer isolated or in the back woods, automotively speaking, but stands side by side with the repair shops of the big towns and cities when repairs, overhauls and rebuilding are considered.

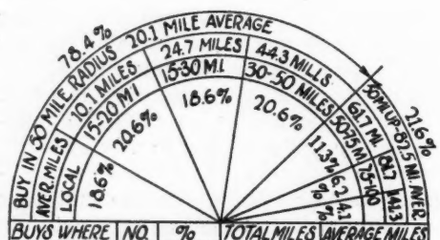
No longer does the cross-road or small-town vehicle owner go to the big town for his electrical repairs, or to purchase accessories—he buys at home.

So much for the consumers' influence on the changes in the automotive retail business today.

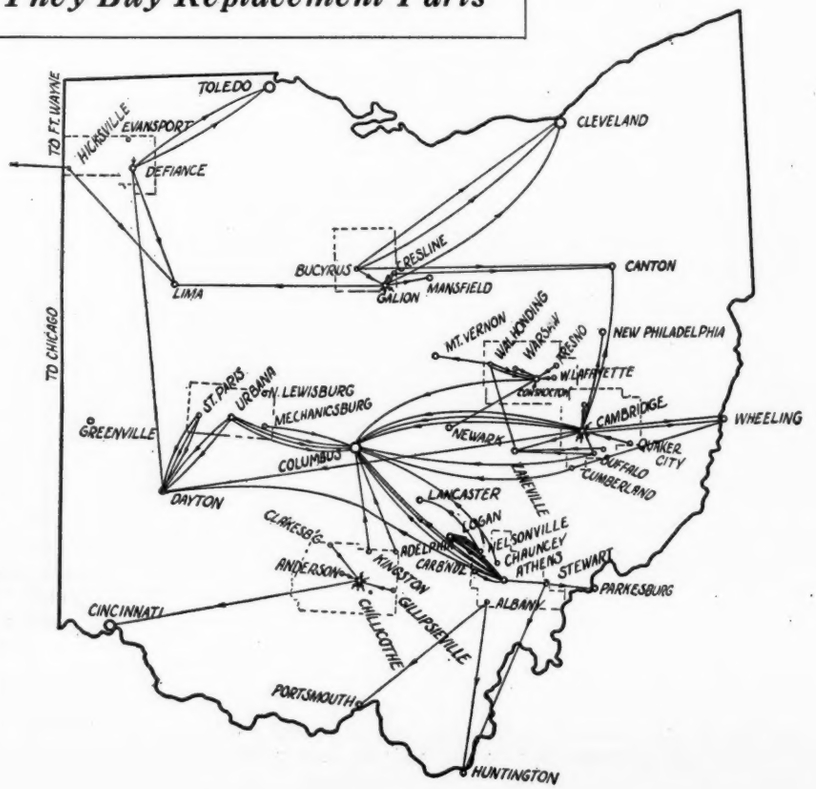
The automotive retailer has made certain changes in his business because of pressure exerted by lowered prices and the higher cost of doing business, which has necessitated his wrestling with the problem of constantly increasing business with lessening profits.

Where They Buy Replacement Parts

The accompanying map and chart show where the dealers, garages and repair shops in the seven Ohio counties investigated are buying their replacement parts. Note that 78.4 per cent of them are buying within 50 miles of home



BUYS WHERE	NO.	%	TOTAL MILES	AVERAGE MILES
LOCALLY	18	18.6		
15-20 MILE	20	20.6	202	10.1
15-30 MILE	18	18.6	445	24.7
30-50 MILE	20	20.6	885	44.3
50-75 MILE	11	11.3	678	61.7
75-100 MILE	6	6.2	490	81.7
OVER 100 MI.	4	4.1	565	141.3



7 Ohio Counties Shows— *Small Towns* of Major Importance as *Distribution* Centers

The retailer has also had to live with the constantly increasing pressure from the manufacturer and wholesaler for greater sales in order that the manufacturer can continue with his increased production.

It is not surprising that with these conflicting situations a definite measure of chaos in automotive distribution should have arisen. Such chaos is with us today.

For the purpose of contributing some data on this subject of distribution of automotive merchandise (not the distribution of the vehicles), a buying study of the retailer was decided upon by the Chilton Class Journal Co. It comprehended getting from such retailers as car dealers, garages and repair shops, information as to where they are purchasing various lines of merchandise and from whom, thereby bringing together a group of authoritative buying facts.

Retailer Makes Own Plans

So often the manufacturer has drafted his plans for selling but the automotive retailer has not bought as the manufacturer or wholesaler might have desired. It is the retailer who blazes the trails of buying that later become the channels of distribution.

This study of the buying habits of retailers was also considered desirable in that today distribution has supplanted production as the key problem of industry. Ten or 15 years ago production was the problem. Then the manufacturer asked, "Can I produce in greater quantities so as to meet the demand?" Today this manufacturer asks, "Can I distribute or sell what I have capacity to produce?" The tables have turned.

The distribution factor has become dominant because of the urge for quicker service, not only from the 52 per cent of the vehicles that are in our growing cities and towns, but from the 48 per cent that are at the cross-roads.

There is no doubt, but that 22,000,000 motor vehicles are going to continue to be used and that this number will be added to each year and that the vehicles will be kept in a reasonably satisfactory state of maintenance, but there is grave doubt among manufacturers of the parts and materials needed in the operation and maintenance of these vehicles as to the most direct and certain course by which these products pass from the manufacturer to the automotive retailer.

It was decided to make a buyer's study of certain sections of a state and to secure the facts as to what is purchased, by whom and from whom.

The objective was to learn how many of the car dealers, garages and repair shops purchased different products such as chassis replacement parts, electric replacement parts, brake lining, accessories and tools and shop equipment.

It was also desired to learn from what wholesalers such products were purchased and to ascertain any changes taking place in automotive distributing centers.

It was decided to make a complete study of the buying by motor car dealers, garages and repair shops of seven counties in the state of Ohio. Ohio was selected because it has been frequently selected as a field of distribution study. It has several important distribution centers scattered over the state and other nearby centers in adjoining states.

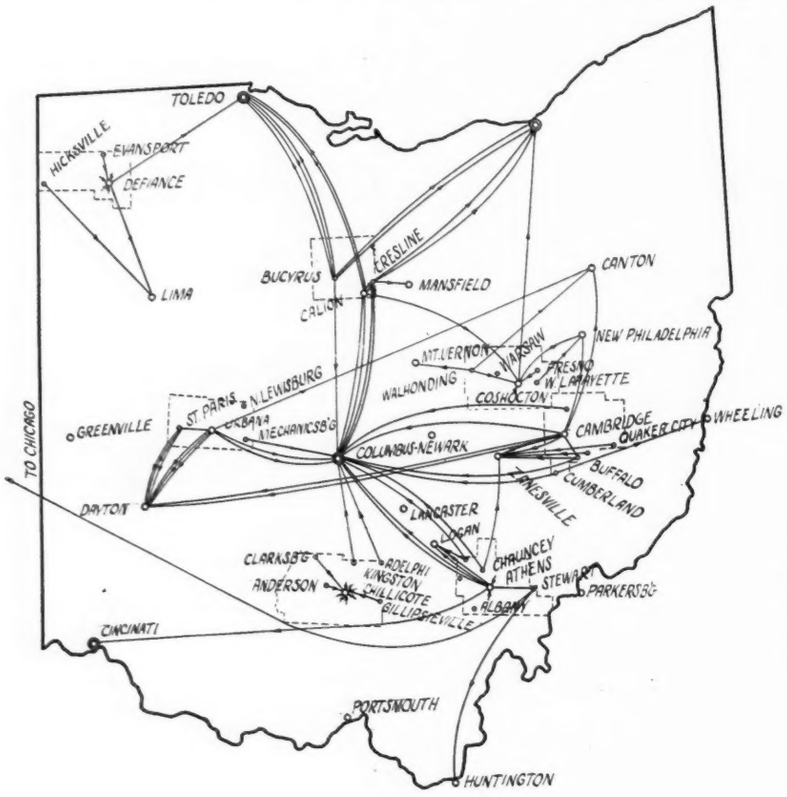
The selection of the seven counties was important. Front-door counties, that is, adjacent to such large cities as Cleveland, Columbus, Canton, Cincinnati, Dayton and Toledo were not selected, as it seemed reasonably certain that the majority of the automotive retailers in such counties were fairly sure to make their purchases from concerns in such cities. It was also realized that the manufacturer has been closer, much closer, to the large centers than he has to the cross-roads.

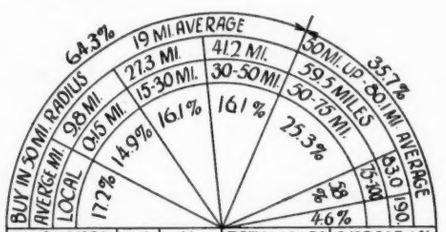
In the selection of the seven counties intervening areas more or less midway between such large distributing centers were selected, to ascertain if the automotive retailers, in these intervening spaces, are buying largely through the big distributing centers or to discover if newer distributing centers nearer home are coming into existence because of the owner's urge for maintenance products and also because of 48 per cent of the cars being owned at the cross-roads.

Quicker Service for Growth is Explanation in Near-Home Buying

"I get quicker service" was one of the main reasons advanced by retailers for purchasing their automotive supplies in small, nearby towns which have not heretofore been considered even as third-line distribution centers

Where They Buy Starting, Lighting and Ignition Parts





BUYS WHERE	NO	%	TOTAL MILES	AVERAGE MI.
LOCALLY	15	17.2		
15 & UNDER	13	14.9	127	9.8
15-30 MILE	14	16.1	375	27.3
30-50 MILE	14	16.1	576	41.2
50-75 MILE	22	25.3	1310	59.5
75-100 MILE	5	5.8	415	83.0
OVER 100 MI.	4	4.6	76.0	190.0

The Ohio shops buy 64.3 per cent of their starting, lighting and ignition parts from distributors located in medium-sized towns within a 50-mile radius. It will be seen that such towns as Zanesville, Coshocton and Chillicothe do a good business in the distribution of these materials

The seven counties selected are a fair average for the state if the front door-counties adjoining large distributing centers are not considered. There is one motor vehicle for every 4.4 persons in the state of Ohio and the car population and ratio of population to vehicles for the seven counties follows:

Counties	Vehicle Population	Pop.—Vehicle Ratio
Athens	9421	5.3
Champaign	6679	3.8
Coshocton	7440	3.9
Crawford	9787	3.7
Defiance	6463	3.8
Guernsey	8534	5.3
Ross	6619	4.3

Five of these seven counties have more vehicles in ratio to population than the entire state and only two of them (Athens and Guernsey) have a poorer population-to-vehicle ratio than the state.

Five questions were asked each of the 366 motor car dealers, garages and repair shops in these seven counties. Here are the questions:—

1. From what jobbers do you buy replacement parts, such as pistons, rings, valves, gears, bearings, etc.?
2. From what jobbers do you buy repair parts for starting, lighting and ignition devices?
3. What make of brake lining do you buy and from what jobber or jobbers?
4. From what jobbers do you buy accessories, bumpers, horns, shock absorbers, etc.?
5. From what jobbers do you buy tools and shop equipment?

A total of 112 replies out of 366 questioned, or 30 per cent replies, was a higher return than is generally received in investigations of this character. Not infrequently 10 per cent replies is accepted as a satisfactory sample or cross-section in such a study. Twenty per cent is considered very good and 30 per cent is so high as to constitute a most reliable sample or cross-section for the investigation.

The results of the study are divided into five distinct groups based on the five questions asked. These are graphically portrayed by the five buying maps herewith. These maps show where these car dealers, garages and repair shops are buying the five groups of products named above.

An arrow leading from one city to another indicates that the retailer is buying from a wholesaler located in the city to which the arrow leads.

Short arrows pointing into and immediately surrounding a city, Chillicothe for example, indicate that for each arrow there is a local car dealer, garage or repair shop buying from some wholesaler in that city. The outlines of the seven counties are indicated on the maps.

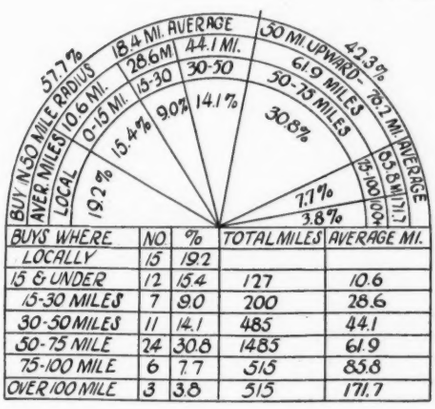
Trends in Buying

Before proceeding to an individual study of each of the five groups of products a few general observations on trends in buying, so far as the location of wholesale centers is concerned, will prove illuminating.

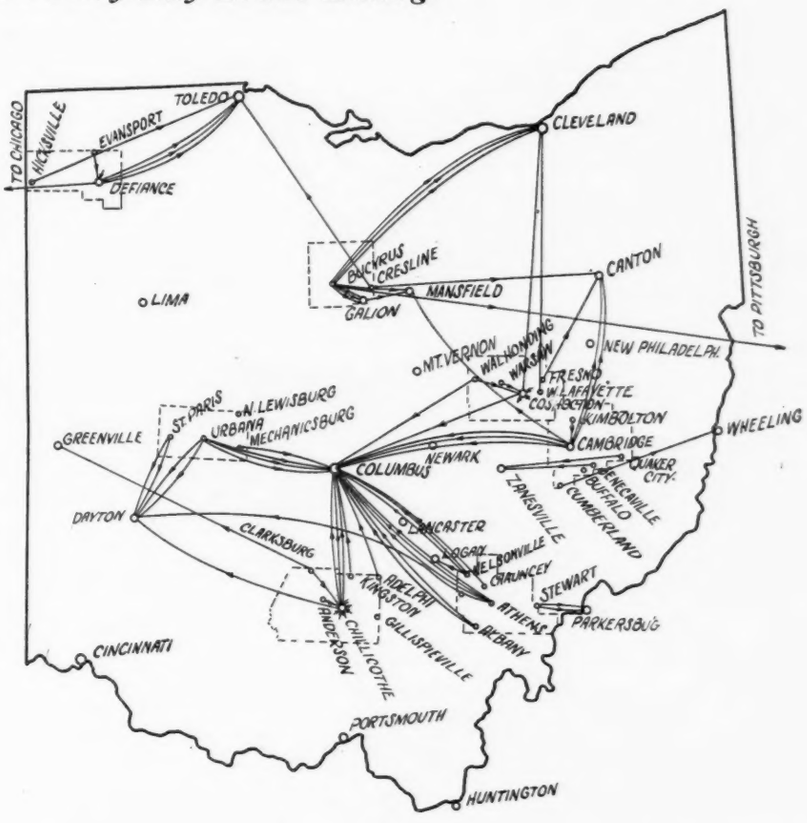
This study shows that there is already a definitely established habit among car dealers, garages and repair shops to buy all of their products as near home as possible.

For example, 78.4 per cent of these are purchasing their chassis replacement parts within 50 miles of home. When it is considered that the counties selected are intervening ones, midway between large distributing centers where the great majority of automotive wholesalers are located, the extent of this near-home buying can be more fully appreciated. The percentage would be much higher had front-door counties of such big cities as Cleveland, Columbus, Cincinnati, Dayton and Canton been selected.

Where They Buy Brake Lining



BUYS WHERE	NO	%	TOTAL MILES	AVERAGE MI.
LOCALLY	15	19.2		
15 & UNDER	12	15.4	127	10.6
15-30 MILES	7	9.0	200	28.6
30-50 MILES	11	14.1	485	44.1
50-75 MILE	24	30.8	1485	61.9
75-100 MILE	6	7.7	515	85.8
OVER 100 MILE	3	3.8	515	171.7



Brake lining is bought within a 50-mile radius by 57.7 per cent of the garages and repair shops. Chillicothe, Galion, Zanesville and New Philadelphia, are among the distribution points. A surprising revelation was the large number of shops that are lining brakes

Replacement parts for starting, lighting and ignition are also purchased near home, the study showing that 64.3 per cent of the buyers obtain these within 50 miles of their place of business.

In purchasing brake lining, 57.7 per cent is bought within the 50-mile radius of the buyer.

The percentage drops materially in accessory buying, but here 49.4 per cent buy within a 50-mile radius of home.

The study shows that 50.4 per cent of tools and shop equipment is bought within 50 miles of home.

Many reasons are advanced by the buyers for this near-home buying, among which the following were most generally given:

"I get quicker service."

"I save freight."

"I have personal contact with the wholesaler."

"I get delivery by motor truck."

The study revealed the very great extent to which nearly all motor car dealers, garages and repair shops are buyers, not only of replacement parts, but parts for starting, lighting and ignition devices, brake lining, accessories, tools and shop equipment.

Of the 112 buyers, the following numbers indicate the buyers of each line of products, these buyers not only stating the city from which they purchased but giving the name of the wholesaler as well:—

	No. of Buyers	Per Cent of Buyers
Chassis replacement parts	100	90
Starting, lighting and ign. pts.	101	90
Brake lining	97	86
Accessories	99	88
Tools and shop equipment	98	87

These figures show that of the 112 car dealers, garages and repair shops, who replied to the questions, practically 90 per cent are buyers of all five lines of products. Analyzed further, this means that automotive chassis repair work is being done in 90 per cent of these places and based on a 30 per cent reply it is a conservative assumption that 90 per cent of the automotive retail establishments in the seven counties are engaged and equipped to do such repair work.

Further, 90 per cent of these places are purchasing repair parts for starting, lighting and ignition and doing repair work on such.

Similarly, brake lining work is done by 86 per cent of them and 87 per cent are purchasers of tools and shop equipment, an indication of how broad is the market in this field.

Concentrated Buying

The study revealed another very definite habit in buying on the part of the car dealer, garage and repair shop, namely, the established tendency to purchase all merchandise of a similar line from one wholesaler, as the following examples will show:—

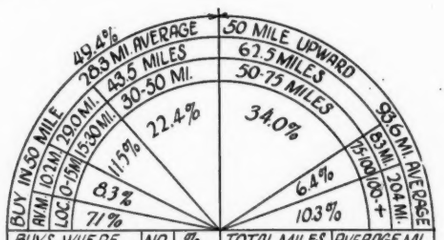
Of the 100 buyers of replacement parts, in this study, 72 per cent buy these parts from one wholesaler each. Here is the tabulation for the different products:

Replacement parts	72% buy from one wholesaler
Starting, lighting and ign. pts.	74% buy from one wholesaler
Brake lining	72% buy from one wholesaler
Accessories	35% buy from one wholesaler
Tools and shop equipment	50% buy from one wholesaler

Still another observation is the extent to which buying by these 112 car dealers, garages and repair shops is divided among many wholesalers. No half-dozen wholesalers control the bulk of the buying in any one division, as the following figures indicate:

The 100 buyers of replacement parts, make their pur-

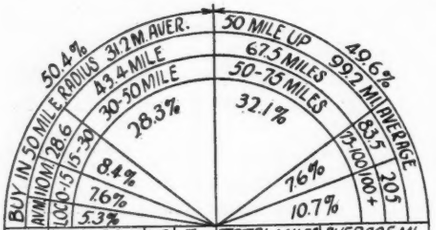
Where They Buy Accessories



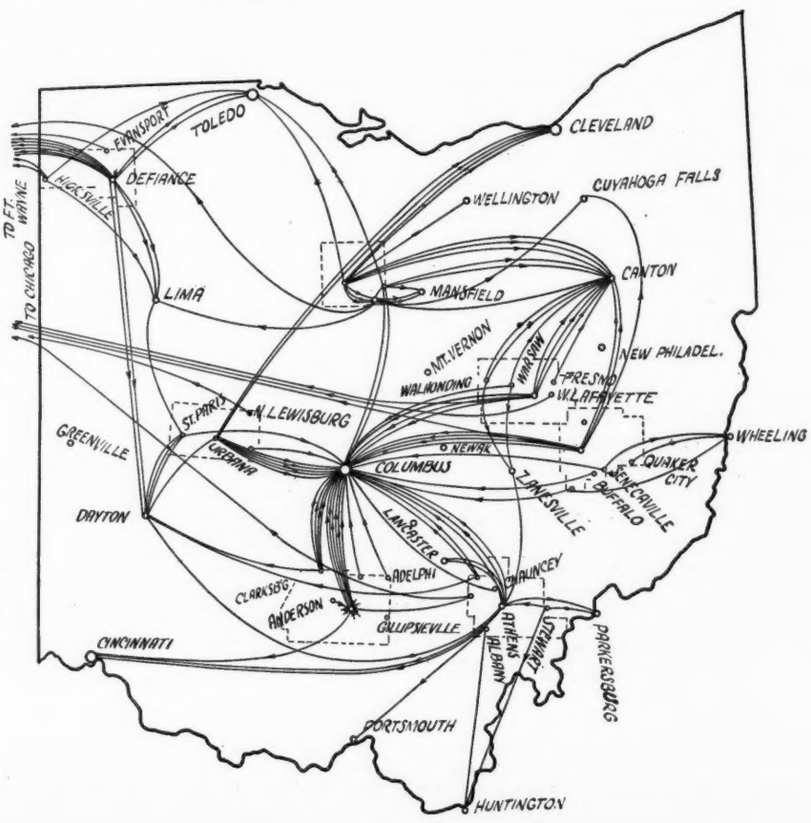
BUYS WHERE	NO.	%	TOTAL MILES	AVERAGE MI.
LOCALLY	11	7.1		
15 & UNDER	13	8.3	133	10.2
15-30 MILE	18	11.5	520	29.0
30-50 MILE	35	22.4	1520	43.5
50-75 MILE	53	34.0	3307	62.5
75-100 MILE	10	6.4	830	83.0
OVER 100 MILE	16	10.3	3260	204

Accessories present a slightly different picture in that only 49.4 per cent of the dealers and garages buy within 50 miles of home. This is no doubt due to the fact that accessories can be stocked with less risk and there is less need for quick service from the distributors.

Where They Buy Tools



BUYS WHERE	NO	%	TOTAL MILES	AVERAGE MI.
LOCALLY	7	5.3		
15 & UNDER	10	7.6	110	11.0
15-30 MILE	11	8.4	315	28.6
30-50 MILE	37	28.3	1605	43.4
50-75 MILE	42	32.1	2840	67.5
75-100 MILE	10	7.6	835	835
100 & OVER	14	10.7	2875	205



Even tools are bought near home. Of the shops queried as to their practice in respect to tool purchases, 50.4 per cent replied that they relied on distributors within a 50-mile radius to supply their needs. Considerable business goes to Mansfield, Lima and Chillicothe

chases from as many as 50 different wholesale houses.

The 101 buyers of replacement parts for starting, lighting and ignition buy these from 49 different wholesalers.

The 97 buyers of brake lining buy from 36 different wholesalers.

The 99 buyers of accessories buy from 57 different wholesalers.

The 98 buyers of tools and shop equipment buy from 51 different wholesalers, and not a few buy direct from the machinery manufacturers.

Buying habits in these seven intervening counties, as divided between purchases made in smaller wholesale centers, and more remote larger centers, is best studied under the different divisions of purchasing, such as replacement parts, electric parts, brake lining, accessories and shop equipment, but an observation or so is in order in this general summary.

In the buying of replacement parts, ignition parts, and brake lining, the smaller and newer buying centers have developed an unexpectedly large volume of business. For example, in Coshocton County 66 2/3 per cent of the concerns buying, buy from wholesalers of parts in Coshocton. Coshocton is not generally listed as a third-line distributing center and yet so far as this survey goes 2/3 of the parts business, according to number of buyers, is within the county.

This buying habit is also noted in connection with purchases from wholesalers in Cambridge, which place is not listed as even a third-line distributing center.

Chillicothe, which is generally listed as a third-line distributing center, controls 75 per cent of the buyers, of parts within the country, as based on the study.

In the buying of accessories and tools and shop equipment, such major distributing centers as Columbus, Dayton, Canton, Toledo, Cleveland and Zanesville have a strong hold on buying.

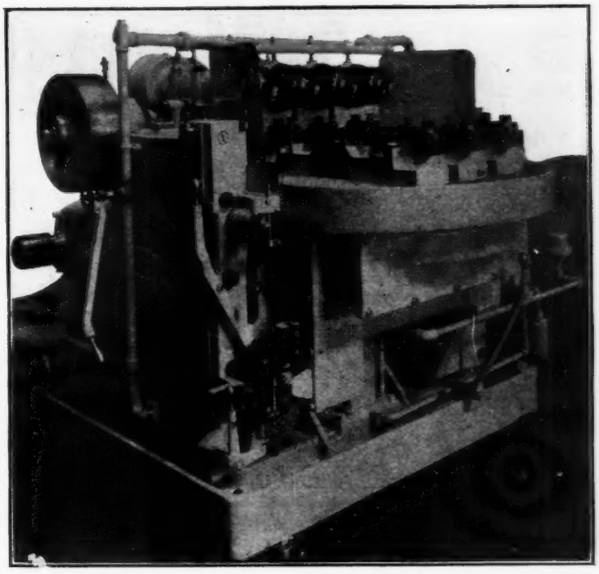
The buying habits in each of the five different groups will be examined in a second instalment to appear next week.

Milling Machine for Connecting Rod Operations

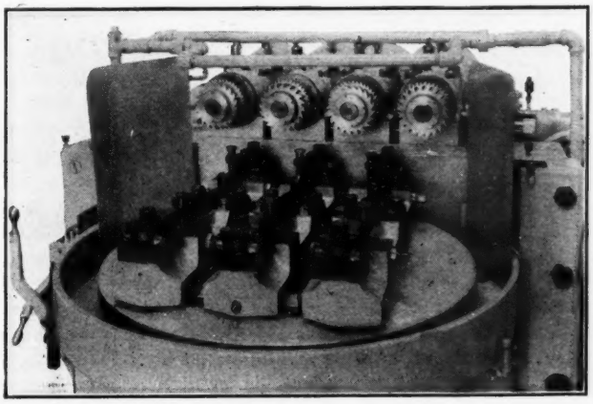
THE Newton Works of the Consolidated Machine Tool Corporation, Rochester, N. Y., have recently built an improved "rise and fall" milling machine for slitting caps and milling bolt bosses on connecting rod heads. This new machine is claimed to make possible an increase in production of about 40 per cent over that obtained with previous machines of this type. Two illustrations are shown herewith, one being a general view of the machine and the other a close-up view of the table with its work-holding fixtures, and of the cutters.

The spindles are now mounted on roller bearings, and each of the four heads is separately adjustable horizontally to vary the center distance. The table gibs are located in line with the cutters and also on a line with the center of gravity of the table, which arrangement is said to give smoother feed action and greater rigidity. The gibs are fully protected against cutter coolant and chips, which pass through an opening in the base to a pan in the back, from where they can be readily removed by the operator.

The table is provided with a vertical oilgear feed and quick movement. By means of a screw on the oil pump the rate of feed can be quickly adjusted. The quick movement is much faster than on previous machines, and its length can be varied by means of adjustable dogs on the side of the knee. This makes it possible to quickly set up the machine for connecting rods of different size, the only mechanical change being the adaptation of the fixtures to the different sized rods.



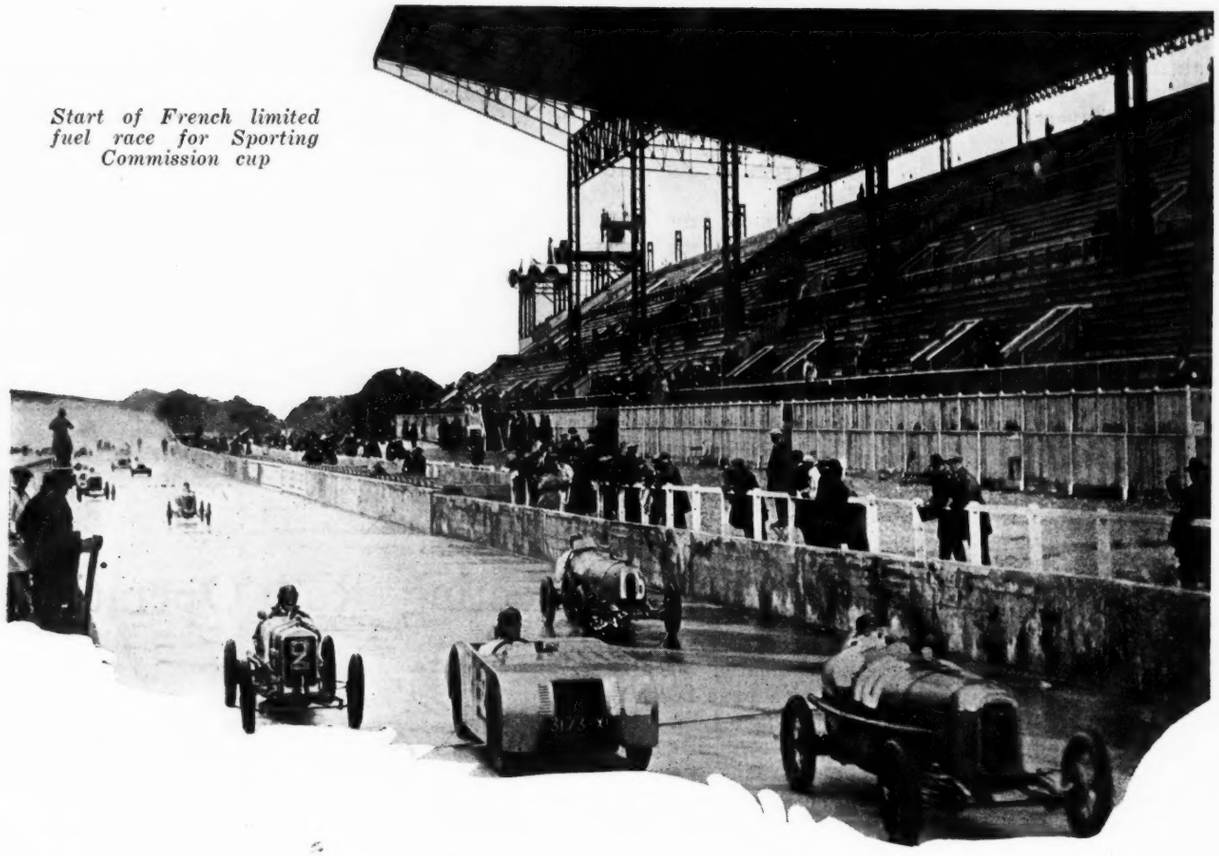
Newton "rise and fall" milling machine designed for operations on connecting rods



Close view of work table with fixtures and of cutters

The table is provided also with a power index controlled by a hand lever, which eliminates hand operation. There are on the table two sets of three fixtures each, the two sets being 180 deg. apart, which enables the operator to load one set while the cut is being taken on the other. The table is held in one of three positions by means of a taper index pin which is held in a taper bushing by a heavy spring. This plunger is connected to a hand lever so that the operator can disengage it during the power traverse of the table. A pin on the side of this hand lever interlocks with a plate on the machine upright in such a manner as to eliminate any possibility of pulling out the index pin during the cut travel.

While the chief aim in the design has been maximum production, an incidental advantage obtained is economy of floor space required.



Start of French limited fuel race for Sporting Commission cup

Benoist Wins French *Grand Prix in* Straight-Eight Delage

Averages 77.24 m.p.h. for 372.7 miles. Free-for-all is won by Divo driving a Talbot. Peugeot piloted by Andre Boillot takes limited fuel contest.

By W. F. Bradley

THREE of the most important events on the French racing calendar were held this month—the French Grand Prix, the 77-mile free-for-all staged by the Automobile Club of France in conjunction with the Grand Prix, and the Sporting Commission Cup contest wherein the cars were required to cover 248.5 miles with 97 lb. of fuel and oil, this including lubricant for the gearbox. All three events were run over the Montlhery circuit, near Paris.

The Grand Prix was captured by Robert Benoist, who averaged 77.24 m.p.h. for a distance of 372.7 miles. Benoist, who also won in 1925 over the same circuit, drove a supercharged straight-eight Delage of 91½ cu. in. piston displacement, having a single seater body 31 in. wide. His average was 7.5 m.p.h. faster with the 91½ in. car than with the 122-in. model of a couple of years ago. The distance, however, had been reduced nearly 50 per cent.

Bourlier, on a similar Delage, came second, average 76.1 m.p.h.; Morel, also on a Delage, was third, and Williams-Moriceau on a Talbot finished fourth. At the last moment the Bugatti team was withdrawn on the grounds that they were not ready. The start was thus given by the American aviators Chamberlin and Levine to seven cars only—three Delages, three Talbots and an English Halford.

This was the first occasion that Delage and Talbot cars had been brought together in a race, and as there is intense rivalry between them, a very keen race was expected. The Delages proved their superiority, for the first two cars went through the race without any mechanical trouble and the third was delayed only by difficulty in getting gas to the carburetor. Benoist got the lead on the fourth of the 48 laps and held it to the end.

Divo, the chief of the Talbot team, was forced out while in second place with either a broken valve or a broken compressor. Louis Wagner, with the same make of car, was forced out 40 miles from the end, also with compressor trouble. The third Talbot finished a long way behind the leaders. During the race Benoist covered a lap of the road circuit at 81.99 m.p.h., which is the highest speed ever attained on this set of roads.

The race was a popular success, uniting the biggest crowd ever seen on the Montlhery speedway, and estimated at 100,000. Next year's French Grand Prix, according to the new International rule, will be open to any type of car, with weight limits between 1100 and 1543 lb.

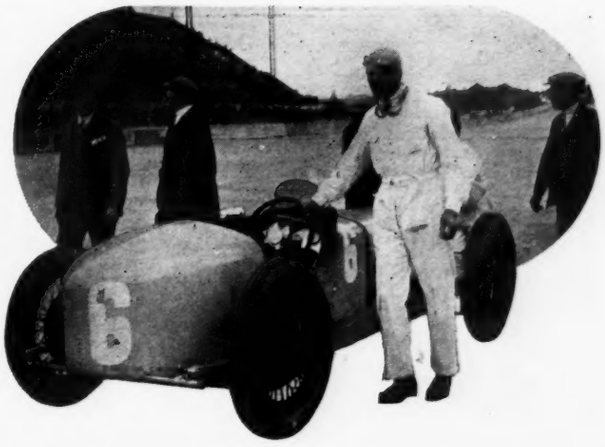
This year's race was the first 1500 cc. contest in which the cars came to the starting line in a fully prepared condition. The change from 122 to 91½ in. was an opportunity for European makers to build entirely new cars, but this task involved so many difficulties that the whole of last year's racing was a fiasco, for in one major race Bugatti only came to the starting line, in two others Delage was seriously handicapped by the position of his exhaust, which roasted the drivers, and Talbot was so unprepared that the firm declined to start.

1926 Models Made Over

The cars in the French Grand Prix, therefore, are the 1926 models with the various bugs removed. Talbot has entirely rebuilt the chassis and front end but has made comparatively few changes in the engine. The peculiarity of these models is the use of a very deep girder frame, with the axles passing through it, and the driver sitting inside it; sheet aluminum plates are screwed over the frame members. To get a better weight distribution the frame has been widened and the engine and transmission are placed out of center so as to bring the driver by the side of the propeller shaft, for the present European rule calls for a 31-in. body with driver only aboard. The front axle is tubular, in two parts, flanged and bolted together at the center. While the design is similar to that of last year, the entire axle has been stiffened. The front springs are now shackled at the forward end and pivoted at the rear. Brakes are Perrot mechanical type, operated direct.

It is understood that the engine peaks at 6300, and the power output is declared to be in the neighborhood of 160. The Talbots have a track of 51 in. and a wheelbase of 98 in. Their weight empty is 1540 lb.

Delage raced with last year's cars entirely rebuilt, the engines being straight-eights of 55.8 by 76 mm. bore and stroke, having two valves in the head, a single piece crankshaft with nine roller bearings and roller bearing for the connecting rods. The Rootes type compressor was mounted on the front of the engine, driven from one of the intermediate train of pinions for the camshaft drive, but at engine speed. The engine had a compression ratio of 5 and developed its maximum power, believed to be 160, at 7500 r.p.m.



Robert Benoist, winner of the French Grand Prix

Use was made of an indirect geared up fifth gear, for the Montlhery road circuit comprises fast straightaways and difficult winding portions. Perrot front wheel brakes were used, together with a mechanical servo. Front springs were shackled at the front and pivoted at the rear. To get the drivers low, the engine and transmission were set slightly out of center in the frame, thus bringing the drivers by the side of the propeller shaft. Maximum height of the cars was 35 in. Having a wheelbase of 98 in. and a track of 51 in., the cars weighed 1635 lb. empty.

Albert Divo, handling a 91½ in. supercharged Talbot won the 77-mile free-for-all race. His average was 73¾ m.p.h. Henry De Courcelles was killed while driving one of the six-cylinder 91½ in. Guyot Specials brought to Indianapolis last year.

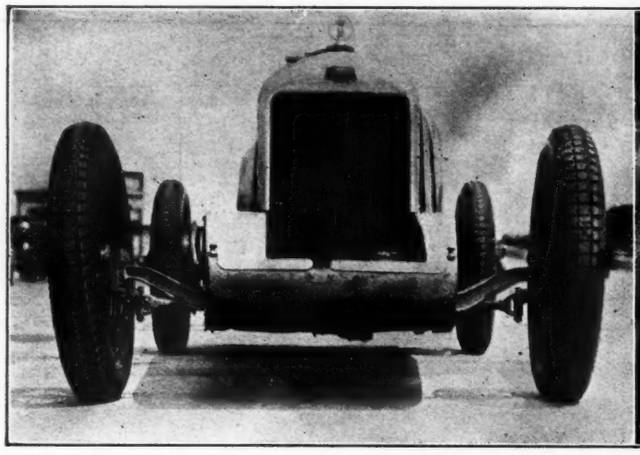
Andre Boillot won the Sporting Commission Cup contest on a sleeve valve Peugeot, with an average speed 63.9 m.p.h. The second car, a six-cylinder 91½ cu. in. Corre La Licorne, driven by Dore, finished 2/5 sec. behind the winner. Third place was taken by Goutte on a four-cylinder 90 cu. in. Salmson. Conelli was fourth on a 91½ in. supercharged Bugatti.

Open to Any Type of Car

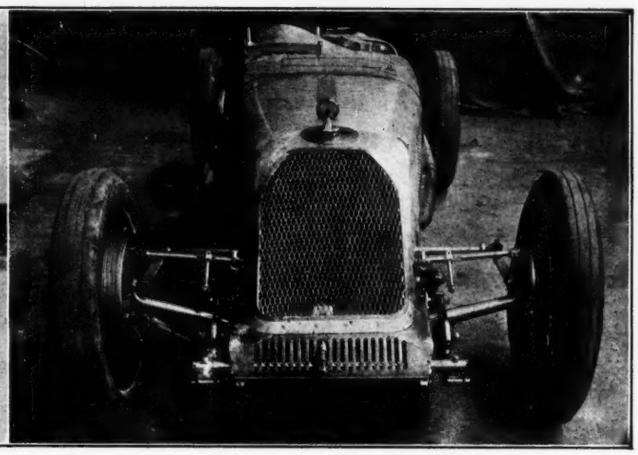
This race was open to any type of car, the only restriction being the amount of gasoline and oil to cover the distance. With the exception of a couple of modi-

Andre Boillot on sleeve-valve Peugeot after winning Sporting Commission cup in limited fuel race at Montlhery

Albert Divo on 91½ cu. in. Talbot with which he won the free-for-all held in conjunction with the Grand Prix



Front view of sleeve-valve Peugeot with entire body offset in frame



Talbot 1500 cc. racer, showing inclined radiator, oil radiator under frame and front shackles

fied Fords, the winning Peugeot had the biggest engine in the race, a four-cylinder sleeve valve type of 149 cu. in. With a single seater body the car weighed only 1397 lb. While most of the units composing the chassis were taken out of stock, important modifications were made. The engine had the high volumetric compression ratio of 7.9, and was equipped with Zenith carburetor, Bosch magneto and Champion plugs. Out of the total allowance of fuel 1.3 gallons were taken for engine lubrication, and to get the best use out of this dry sump lubrication with a big capacity oil radiator was used. This left a quantity of gasoline equivalent to 18.2 miles to the American gallon. No lubricant was taken for the gearbox, for with a view to economy the lay shaft was put out of engagement and the ball bearings for the primary shaft ran without oil.

Head resistance was reduced and weight was saved by using a girder frame and placing the engine and transmission completely out of centre, thus allowing the driver to be seated by the side of the driveshaft. Brakes were removed from the front wheels in order to reduce weight.

Among the other unusual cars were three Lombards with recessed front and rear wheels and a cross section corresponding to that of a thick airplane wing. Owing to unpreparedness, these cars were withdrawn after covering the initial lap. To general surprise, Bugatti put in a set of four-cylinder 91½ in. supercharged cars which not only kept within their gasoline allowance but finished with an unnecessary amount of fuel in the tank. This event showed that with gasoline only limited and all other points left free freak construction was encouraged.

Better Roads Bring More Cars to Indo-China

THE use of automobiles in Indo-China is increasing rapidly. At the end of 1919 there were as yet only 2315 motor vehicles in the French East Indian possessions, of which 1870 were private passenger cars, 348 vehicles in public service and 97 privately owned trucks. On January 1, 1926, the number of cars on the road in Indo-China had grown to 7499, of which 5492 were private passenger cars, 1116 vehicles in public service and 365 trucks.

The rapid development of automobile traffic is due in large measure to the energy with which the construction of improved roads has been carried forward in the country. The country at present possesses 18,700 miles of road, of which 8150 can be traversed by automobiles under all weather conditions. 5800 are being surfaced with stone and are passable at least six months of the year, while 4700 miles are passable during less than six months of the year.

The relation between the mileage of improved roads and the number of cars in use is clearly indicated in the following table giving the road mileages and numbers of cars owned in the three provinces of Cochin-China, Tongking and Cambodia:

	Mileage of Improved Roads	Number of Cars
Cochin-China	2950	3853
Tongking	1715	1968
Cambodia	1210	800

The relationship between road mileage and number of cars owned is less close in Annam, and this is easily explained, for while in the three provinces covered in the cable the improved roads radiate in all directions from important centers of population, the geographical form of Annam reduces its road network to a single main road following the coast from which there are only a few branch roads into the mountainous interior of the country. Therefore, although the mileage of hard-surfaced roads of Annam is equal to that of Tongking, the number of cars owned in the former province is only one-half that in the latter.

At the present time there are 74 public services by motor vehicle.

Vehicles for Indo-China should have a high clearance in order to be able to ford small streams, and they must be of moderate length of wheelbase to facilitate turning in restricted space. Bodies must permit of complete ventilation of the front compartment in summer, on account of the great heat. Commercial vehicles are not allowed to weigh more than two metric tons (4400 lb.) per axle. The minimum road clearance permissable is about 12 in. Open bodies are used almost exclusively, with seats for from two to six.

Cars of French manufacture enter the country free of duty, while on others the same rates of duty must be paid as upon importation into France.

THE FORUM

Combustion Efficiency and Carburetion of High-Speed Diesel Engines

Editor, AUTOMOTIVE INDUSTRIES:

In your issue of June 18 on page 939 you publish an article on new Diesel engines signed by P. M. Heldt. In this article are quoted certain statements by Otto Kehrer, of Munich, regarding the combustion efficiency in Diesel and carbureting engines which in my opinion are apt to give some very erroneous impressions if they are quoted without comments.

It is probably true that the high-speed Diesel engine is not yet out of the experimental stage, at least in the sense that any good Diesel designer could not without further preparations go to work and create one that would run creditably. However some very creditable fuel economy curves have already been published for more than one European high-speed Diesel. I refer for instance to curves such as those published for the M. A. N. engine by Dr. Eng. W. Riehm in the V. D. I. of Aug. 29, 1925. It is possible that these are show curves, but it can hardly be doubted that they have actually been attained; and a number of these M. A. N. engines are stated to be in operation on trucks in Germany. The writer remembers having seen curves almost equally creditable also for other engines.

Mr. Kehrer, however, seems to assert that the Diesel engine combustion process is extremely inefficient and not at all to be compared with that of the carbureting engine. This is a startling statement indeed for anybody having any familiarity with the combustion process of the carbureting engine. It should be a well known fact to almost all automotive engineers that the average automotive engine gives its best power with an over-rich mixture and that in consequence all automotive drivers tend to operate their cars with such a mixture. The consequence is considerable amounts of CO in the exhaust, low combustion efficiency and troubles such as those experienced in a Pittsburgh tunnel some time ago when a number of automobiles happened to congregate there. Mr. Kehrer seems to have the idea that a carbureting engine gives best economy with the theoretical air-fuel ratio. This is, however, according to tests by the writer—(See Bulletin No. 19, Engineering Experiment Station, Ohio State University, page 58) true only if the air is properly heated, and in that case best economy and best power do not coincide, as seemed to be very generally realized among automotive engineers some years ago. With cold air an over-rich mixture seems to be required. If the engine would fire properly there are reasons to believe that an improved economy could be attained in the carbureting engine just as in the Diesel engine by providing an air excess. Unfortunately, however, ignition becomes very poor in the carbureting engine when the air-to-fuel ratio reaches values of 17 or 18 even with heated air, and less than this with cold air. The localized ignition process in the carbureting engine is an evil thing in many ways. This is but one of them.

In a Diesel engine, now, this localized ignition has been eliminated. All the combustion air is heated to a temperature beyond the ignition point. In consequence of this the Diesel engine can handle fuel that the carbureting engine could never touch and it can use air excesses at which the carbureting engine would fail to fire entirely. Far from this being an evil thing, as Mr. Kehrer seems to believe, it is a most excellent thing. It serves to keep the peaks of temperature down. These peaks, if they occurred suddenly, would, in the Diesel engine, lead to pressure rises which would be extremely unpleasant to deal with mechanically. As a matter of fact, a card with a much smoothed out pressure peak, *i.e.*, with delayed combustion, is a thing most Diesel engineers desire devoutly, although it is a thing not altogether easily attained with airless injection.

The Diesel engine combustion process is then slower than that of the carbureting engine, for good and sufficient reasons, one of which is, of course, the coarser subdivision of the fuel. This does not mean, however, that the combustion finally needs be less complete than that of the carbureting engine. As a matter of fact, to judge by figures published by the Bureau of Mines (Report No. 187-B-41) it can hardly be under ordinary operating conditions. The exhaust of a Diesel engine is usually excellent when compared with that of a carbureting engine attempting to handle at all heavy fuel.

As I have said, the high-speed Diesel may still present problems that it is not everybody's business to tackle. However, the problems are evidently being solved, and Diesel speeds already attained abroad—I believe the record is 4000 r.p.m. in the case of the Frey motor-cycle Diesel—fully justify the assumption that a light-weight fairly high-speed Diesel automotive and aeronautical engine will be a common thing in a not too distant future, with great advantage from the points of view of economy, safety, etc.

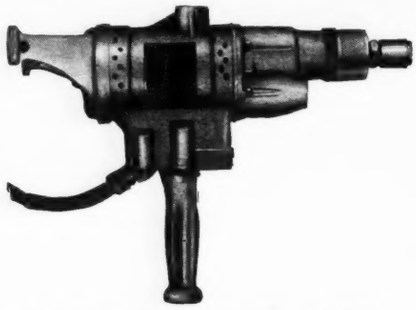
C. A. NORMAN,
Ohio State University.

NEW DEVELOPMENTS—Automotive

Thor High Cycle Tools

THE Independent Pneumatic Tool Co., Chicago, has announced an entirely new line of electric portable tools all powered with squirrel cage motors operating on 180-cycle current.

The type of motor used in these tools eliminates armature windings, commutators and brushes, which often cause trouble in universal motors. The Thor rotor employs solid copper bars, riveted and welded in position. Gears are of high grade steel and the stator and gear cases are of aluminum.



Independent Pneumatic Tool Company's new high-frequency drill

A feature of these high-cycle tools is their relatively constant speed under load, there being very little slip. Their size and weight is about one-third that of 60-cycle tools of similar power. Frequency changers are necessary to step ordinary 60-cycle current to 180 cycles but it is said that any shop having 10 or more tools in use will find such an investment profitable.

The Thor line comprises drills, reamers, screw drivers, tappers, nut setters, grinder and reamers. The tool illustrated is a high-frequency drill which weighs 24 lb., has a speed of 380 r.p.m., and is suitable for drilling up to ⅞-in. and for reaming 13/16-in. It can also be used for nut setting up to ¾-in.

Redesigned Badger Grinder

THE Badger Tool Co., Beloit, Wis., has redesigned its machine for automatically grinding the eyes of leaf springs and bumpers. This is a double-spindle type of grinder, each wheel spindle being driven by a 7½-hp. built-in motor and carrying either 16-in. or 18-in. cylinder grinding wheels held in chucks.

The work carrying member consists of a ram adjustably mounted on two parallel arm castings which are supported on two parallel shafts. The inner, or camshaft, acts as a support for the inner arm, whereas the outer shaft is connected to the outer arm and imparts the drive to the work carrying ram.

The camshaft is driven through inclosed worm gearing. This unit is located at the right end of the machine and is in the foreground at Fig. 2. The large cam, which determines the motion of the work carrying ram, is removably attached to the outer end of the camshaft. Arm and roller are rigidly secured to the outer end of the driving shaft. A short distance from the same end of this shaft is fastened an arm and weight (Fig. 1) which causes the roller above referred to to follow the large cam, thereby producing the pre-determined motion of the ram which carries the spring eye in and out between the two parallel grinding wheels.

It will be seen that the large cam is not only away from the path of the grindings but is in a very accessible location, so that it can be easily removed and a cam of different shape substituted. It is of large dimensions and is claimed to produce a very smooth action even at high speeds. The cams are formed to give the proper relation between the actual grinding time and the "idling" time.

The "idling" portion of the cam is used when the ram with fixture is out from between the grinding wheels. It is at this moment that the spring is turned end for end for grinding the eye at the opposite end or for placing the new spring into the fixture. No clamping of the spring is required; the spring eye is laid in a hardened V-block attached to the inner end of ram and two adjustable side guides, part way back, align it centrally with the axis of the spring.

In conjunction with the forward and reverse motion of the ram, the grinding wheel heads automatically open and close, thereby leaving both hands of the operator free at all times to handle the spring. Two cams are attached to the camshaft set on the head opening levers, one for each head (Fig. 1). While these two cams and levers open the heads, two levers and weights at the rear of the machine close the heads up to independent micrometer stop screws. In operation, the grinding wheels are apart as the spring eye enters. The wheels then gradually close down on it, one or more short passes are made, during which time the wheels advance up to the stops and remain there while the spring is drawn out to the "idle" period, when it is reversed end for end or a new spring inserted. This action is preferred to that by which the spring eye is forced in between wheels that are fixed relative to each other laterally. It is claimed by the manufacturer that the former principle permits high production and at the same time gives increased accuracy and lessened wheel wear.

It should be mentioned that the operation of the heads can be timed in exact relation to the cross travel of ram and fixture. It will be seen, also, that feeds can be increased or decreased by merely varying the weights used. Four speeds can be secured from a cone pulley on a separate 1-hp. motor. The wheel dresser is conveniently mounted in front and has lateral adjustment so that each wheel can be quickly reached and dressed off in parallel planes.

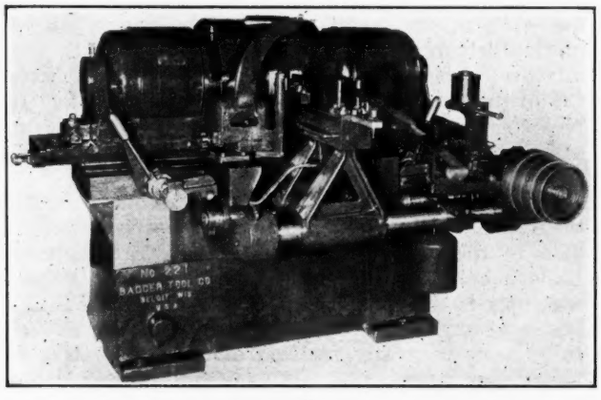


Fig. 1. Badger automatic spring eye grinder, front view

Parts, Accessories and Production Tools

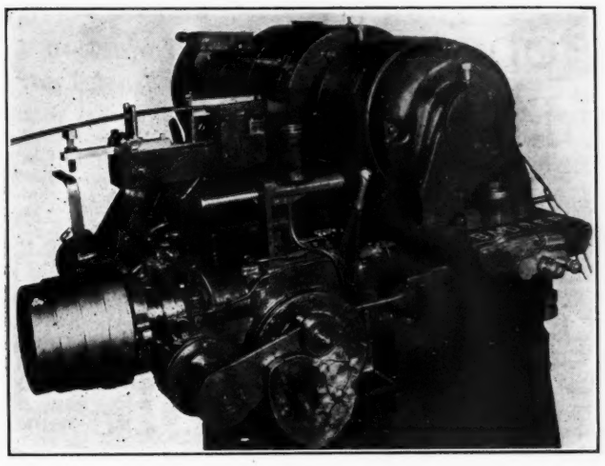


Fig. 2. Badger spring eye grinder, rear view

The main spindles of the machine are mounted in radial and thrust ball bearings, which are lubricated with grease through incased Alemite connections. All shafts are carried in roller bearings. The entire machine, including slides, but with the exception of the main spindle bearings, is lubricated with the Bowen "One-shot" oiling system, the reservoir and plunger of which are visible in Fig. 2.

Special thought has been given to protection against grit and to adjustment and renewability of worn parts. This machine can be furnished in belt drive or bracket type motor drive form, and can be equipped for wet or dry grinding. Cylinder wheels up to 20 in. in diameter and disk wheels up to 24 in. in diameter can be used.

G. E. Limit Switch

A SMALL limit switch has recently been developed by the General Electric Co. for general industrial uses such as stopping carriages at the end of travel, door opening limits and similar applications where normally open or normally closed contact is required. Among the advantages claimed for the new switch are an adjustable operating arm, the possibility of mounting the arm on either side of the switch, great creepage, sliding contact and a varnished cambric lining which completely incloses the contacts and terminal screws, thus eliminating the possibility of grounding or short circuiting from standed wires left by workmen when connecting the switch.

Wrenchless Disk Holder

THE new Wrenchless Disk Holder recently placed on the market by The Manning Abrasive Co., Troy, N. Y., is designed to permit much more rapid changing of sanding pads than with the former type equipment. The new disk contains two slots which are engaged by wings on the disk holder so that disks may be attached or disengaged by a half turn on the disk without recourse to wrenches or other tools.

The new holder fits every type of sanding pad and is fastened permanently to the pad.

New Cylinder Gage

THE L. S. STARRETT CO., Athol, Mass., has brought out a new cylinder gage designated as No. 452B which features a combination of rigid or toggle handle, locking mechanism and hardened and ground steel sled. The combination handle permits it to be made rigid in vertical or angular position or it can be transformed into a universal joint with a wide sweep by a slight turn of the handle.

The locking mechanism clamps the adjustable contact points which are synchronized with the indicating needle so that they may be locked before removing the gage from the cylinder for accurate measurement with a micrometer.

Sullivan Vaporizer

THE Sullivan Vaporizer, a device which functions as a carburetor, has recently been placed on the market by The Sullivan Vaporizer Corp., Long Island City, N. Y. Among the things which the device has been designed to accomplish, according to its makers, are saving from one-third to one-half of fuel; delivery of dry gas to engine; elimination of knocking, crankcase dilution, carbon formation and fouled spark plugs.

New Indestructible Wheel

THE Indestructible Wheel Co., Lebanon, Ind., has announced a new dual pneumatic wheel. Features are, demountable rims; inside rim clamps can be tightened without removing the outside rim and felloe; the new design weighs about 20 lb. less than old type wheels but is stronger; almost any type of hub and brake equipment can be employed.

Holes are provided in the outer felloe through which, by means of a special high-speed wrench, the clamps on the inside rim can be tightened without removing the outer rim or felloe. But, because of the use of a continuous master band to control springing, the new wheel is designed to prevent much of the loosening of rims and felloes.

New dual pneumatic Indestructible wheel

Any type of rim and rim parts recognized as standard for heavy duty service, such as Firestone Type B or Goodyear Type J, can be used on the new wheel. High carbon steel has been used throughout the construction, thus affording light-weight.

The wheels are made in sizes ranging from 30 by 5 to 36 by 8 with a 20-in. tire seat, and from 34 by 5 to 40 by 8 with a 24-in. tire seat.

AUTOMOTIVE NEWS SECTION INDUSTRIES

Philadelphia, Pennsylvania

Saturday, July 23, 1927

Industry Concentrates on New Car Production Plans

PHILADELPHIA, July 23—Price changes and the introduction of new models are occupying the attention of the automobile industry during the season of slow sales. Production is being speeded up as the new cars are shipped to dealers.

Coupled with the new low prices are numerous changes in style and mechanical characteristics well calculated to interest prospective buyers. There is still a tendency toward lower overall height and in some instances further lowering is being achieved through the use of smaller wheels.

Mechanically the old problem of torsional vibration is being overcome by various ingenious devices. Higher engine compressions are again the rule, and the trend in this direction is accelerated by the wider distribution of high-compression fuels.

Motor vehicle registrations totaled 20,744,197 cars, trucks and buses on July 1, according to a survey just completed by *Automotive Industries*. This is a gain of 1,164,329 or 6 per cent over the total for the same date last year. From Jan. 1, 1927, however, there is a drop which is accounted for mainly by the large number of cars scrapped last year and thus removed from the registrations lists of this year.

Over 2,000,000 vehicles were scrapped or otherwise destroyed last year, it is estimated, and the new car and truck sales this year have not made up for the resulting deficiency. It is now of regular occurrence that mid-year registrations should be below the Jan. 1 level.

Nash Orders Exceed Capacity of Plants

KENOSHA, July 18—Production at the Nash plants in Kenosha, Racine and Milwaukee of 700 to 800 cars a day is greater than at any time in the history of the company. This announcement, made today by officials of Nash Motors Co., is coupled with the further statement that in spite of the record production, orders from dealers for the new models announced three weeks ago are in excess of the combined capacity of the three Nash plants and the orders are being filled in rotation as they are received.

Bellanca Buys Plant

NEW YORK, July 16—The Bellanca Airplane Corp., headed by G. M. Bellanca, designer of the trans-Atlantic monoplane, Columbia, has taken an option on the former Downey Shipyard at Arlington, S. I.

June Output in U. S. Shows 314,552 Total

WASHINGTON, July 20—Production of cars and trucks in the United States in June totaled 314,552, as compared with 395,674 in May, and with 380,372 in June last year, according to the Department of Commerce totals released this week. For the six months the United States total is 2,027,840 as against 2,305,877 in 1926, a decline in which each of the first six months of 1927 shared.

Production by companies represented in the National Automobile Chamber of Commerce in June totaled 291,526, this total, however, including the output of Canadian subsidiaries of the N. A. C. C. American companies. With an approximate 20,000 to be added by Canadian output to the United States totals, the Ford output for June is indicated as approximating 40,000 to 45,000.

Passenger car output in the United States in June was 274,374 and trucks, 40,178, comparing with May totals of 352,428 and 43,246, and with June, 1926, totals of 339,570 and 40,802. Passenger car production in the first six months was 1,779,334 as against 2,070,418 in 1926. Truck production was 248,506 as against 235,459. In Canada, the six months totals will show a gain in passenger cars but a loss in trucks.

Totals for the six months period, with Canadian totals included, are shown in an adjoining column.

Hupp Earnings $1,147,823

DETROIT, July 21—Earnings of Hupp Motor Car Corp. in the second quarter, this year, were $662,244 after taxes and charges, against $937,755 in the second quarter, last year. Net profit for the first half was $1,147,823, against $2,060,062 in the first half of 1926.

Briggs Gets $2,265,870

DETROIT, July 20—An agreement has been reached between the insurance companies and the Briggs Mfg. Co. whereby the latter will receive $2,265,870 for the fire loss to plant and equipment at the Harper Avenue plant on April 23.

First-Half Production 276,733 Under Last Year

	Cars	Trucks	Total
1926			
Jan.	284,703	31,388	316,091
Feb.	334,524	38,745	373,269
Mar.	399,105	45,996	445,101
Apr.	401,836	50,189	452,025
May	394,569	47,576	442,145
June	358,388	43,735	402,123
Total ..	2,173,125	257,629	2,430,754
July	329,959	39,643	369,602
Aug.	393,064	44,515	437,579
Sept. ...	363,547	47,304	410,851
Oct.	300,160	43,652	343,812
Nov	226,278	34,500	260,778
Dec.	143,413	27,768	171,181
Total ..	3,929,546	495,011	4,424,557
1927			
Jan.	208,734	40,873	249,607
Feb.	275,470	41,950	317,420
Mar.	360,765	48,699	409,464
Apr.	374,113	48,275	422,388
May	374,419	46,963	421,382
June	290,844	42,916	333,760
Total ..	1,884,345	269,676	2,154,021

Ford Plants to Reach Capacity September 1

DETROIT, July 18—Assured by the Ford Motor Co. that its plants will be operating at capacity by Sept. 1, the City of Detroit is preparing to take care of the extra transportation which will be required of the city's street car system by ordering 125 new cars.

There has been much conjecture in the industry on when Ford would resume operations on a large scale on the new models and some weeks ago it was predicted that the plants would be in full swing by Aug. 1.

G.M. Opens Institute

FLINT, July 20—General Motors Institute of Technology here was formally opened Tuesday. The opening was attended by the largest number of corporation executives ever to visit Flint. A luncheon of the executives at the Hotel Durant, which was addressed by Alfred P. Sloan, Jr., president, and C. F. Kettering, vice-president of the corporation, and by E. T. Strong, president of Buick, and Major Albert Sobey, director of the school.

Sells German Bearings

NEW YORK, July 18—Sachs Bearings, Inc., has opened an office at 114 Liberty St., as United States and Canadian representative of Fichtel & Sachs, A. G. German manufacturers of ball and roller bearings, steel balls, etc. Stocks will be carried.

N.A.C.C. to Combat Newspaper Blocs

Publishers to Get Resolution Citing Unfairness of Combination System

NEW YORK, July 20—Good news from overseas, the adoption of a program to get better advertising per dollar, and the initiation of a campaign to encourage owners to lock their cars, were the high points of the mid-summer meeting of the directors of the National Automobile Chamber of Commerce as announced in the bulletin of directors to members issued this week.

Most of the motor companies have made big increases this year in their export trade. Reports from Alfred Reeves, general manager of the association, now in Europe, indicate that the overseas business is just beginning.

Reports from South America by George F. Bauer, secretary of the foreign trade committee, indicate that the highway movement is going forward very rapidly and that the financing problem there is not insurmountable.

100 Newspaper Combinations

The directors indorsed the recommendation of the advertising managers of the National Automobile Chamber of Commerce to undertake a program leading to the securing of more effective advertising space per dollar of expenditure. The chief problem at the present time is the existence of more than 100 newspaper combinations in cities throughout the country where the advertiser is compelled to purchase two or more newspapers in a given city where one paper may serve his purpose. These combinations have been increasing at the rate of three or four a week. The problem is particularly acute in the automotive field because the dealer needs local advertising support which means that it is not easy for the factory to omit those towns where the forced combination is in effect.

May Seek Other Coverage

The first step which the advertising managers plan is to send a resolution to all newspaper publishers calling attention to the inequity and the uneconomic basis of the forced combination. If the advertiser can reach his market through one paper he should, the advertising managers feel, be able to purchase space in that paper without being forced to take additional circulation which may have little value to him. Furthermore, the necessity of spreading his appropriation under the combination plan leads to fewer insertions and smaller space in any given paper.

The majority of publishers are in accord with the stand of the advertising committee, and the committee plans to work with the publishers' associations and advertising associations in developing sentiment against the forced combination practice. In the last analysis the practice can be met by use of outdoor advertising, direct mail and other measurers for reaching the customer locally. Certain companies are considering this method of approach in forced combination towns where the situation cannot be adjusted. While newspaper advertising is economical when purchased on the basis where the advertiser can make his selection of the medium, its productive value is much hampered when the advertiser is forced to buy unprofitable space in order to get the profitable medium.

Hudson Earnings $9,817,563 in Half

DETROIT, July 20—Net earnings of Hudson Motor Car Co. for the first half of the year were $9,817,563, equal to $6.14 a share, and comparing with $6,057,337 for the six months ended May 31, 1926, or $4.55 a share. The fiscal year has been changed to end Dec. 31. Earnings in the second quarter this year were $5,791,048, equal to $3.62 a share, and comparing with $4,026,515 in the previous quarter, or $2.52 a share, and with $3,311,314, or $2.49 a share earned in the fiscal quarter ended May 31, 1926.

Goodyear Sells Stock In New British Unit

NEW YORK, July 20—Financing for the Goodyear Tire & Rubber Co. manufacturing plant to be established at Wolverhampton, England, is being handled in the London market by Baring Brothers & Co., Ltd., through an offering of £800,000 debenture stock of the Goodyear Tire & Rubber Co., Ltd., a new British subsidiary. The issue consists of 6½ per cent stock priced at 98. Payment of interest until 1930 is unconditionally guaranteed by the parent company.

Pierce-Arrow Adds Models

BUFFALO, July 18—Pierce-Arrow Motor Car Co. has added a five-passenger sport sedan landau and a convertible coupe to its series 80 line at $3,025 and $3,350 respectively. The sedan is offered in a wide variety of color combinations. Upholstery is broadcloth. The convertible coupe has a rumble seat. Upholstery and color of finish is offered optionally.

LaSalle Builds New Sedan

DETROIT, July 14—The Cadillac Motor Car Co. announces a new LaSalle five-passenger town sedan listing at $2,650. The new car possesses characteristic LaSalle lines and is distinguished by unusual features in seating arrangement. The rear seat has been moved forward several inches closer to the driving seat giving practically the same effect as in a Victoria-type body.

Business in Brief

Written exclusively for* AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co.

New York, July 21—Trade in some lines has been stimulated by warm weather during the past week, while industry has shown the opposite effect. The weather has continued generally favorable to crop progress. Both stock and commodity prices advanced last week, while money rates were slightly easier.

FREIGHT CAR LOADINGS

Railway freight car loadings during the week ended July 2 numbered 1,021,262, as against 1,018,206 in the preceding week and 1,065,641 in the corresponding period last year. Loadings for the year to date total 26,347,988, which compare with 26,074,792 a year ago and 25,194,689 two years ago.

CRUDE OIL OUTPUT

Crude oil production remained practically at the peak during the week ended July 9, averaging 2,534,950 bbl. daily, as against 2,535,550 bbl. a week earlier and 2,032,650 bbl. a year ago.

FOREIGN TRADE

The preliminary foreign trade report for June shows an exact balance between exports and imports at $359,000,000. This figure compares with exports of $338,000,000 and imports of $336,000,000 in June last year. For the fiscal year ended June 30, exports total $4,971,000,000 and imports $4,256,000,000, leaving an export surplus of $715,000,000, as against $287,000,000 a year ago.

BANK DEBITS

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended July 13, were 10.1 per cent smaller than the total for the preceding week but 7.4 per cent above that for the corresponding period last year.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices stood at 140.5 last week, as against 139.9 a week earlier and 140.4 four weeks earlier. The monthly index of the Bureau of Labor Statistics declined from 144.1 in May to 143.7 in June.

FEDERAL RESERVE STATEMENT

Bills and securities held by the Federal Reserve banks declined $83,100,000 during the week ended July 13, the principal change being a decrease of $80,600,000 in discounts. Note circulation declined $47,800,000, while deposits increased $20,300,000 and reserves $29,900,000. The reserve ratio rose from 76.8 to 78 per cent.

During the same period, loans of reporting member banks declined $183,075,000, with a decrease of $135,645,000 in security loans. Investments declined $31,006,000, borrowings from the Federal Reserve banks $79,779,000 and net demand deposits $40,474,000.

Mott Heads Newest G.M.C. Subsidiary

Realty Corporation Will Have Million Initial Capital—Insures Future Outlets

DETROIT, July 18—Further details on the Argonaut Realty Corp., which has been organized under the laws of Delaware and its entire capital stock of $1,000,000 subscribed by General Motors Corp. were made available this week.

It will be the function of this latest subsidiary to acquire sites in various cities and erect service stations and sales rooms for dealers in General Motors passenger cars and trucks. Under the plan the corporation will enter into a lease agreement with the dealer whereby the latter will, after filling certain requirements, agree to lease the property for a period of approximately 10 years.

The board of directors is made up of Donaldson Brown, Fred J. Fisher, Charles S. Mott, John L. Pratt, M. L. Prentis, John J. Raskob and Alfred P. Sloan, Jr.

Mr. Mott has been elected president of the new corporation and other officers follow: Donaldson Brown, Fred J. Fisher and J. L. Pratt, vice-presidents; T. S. Merrill, secretary; M. L. Prentis, treasurer; Frank Turner, comptroller, and A. Bradley, assistant treasurer.

Two Committees Direct Work

The activities of the corporation will be vested in the hands of two committees. The operating committee will comprise the following: C. S. Mott, chairman; M. L. Prentis, James MacEvoy and Harry T. Hickie. The finance committee will comprise Donaldson Brown, chairman; C. S. Mott and M. L. Prentis.

Harry T. Hickie, who has been identified with the sales division of the corporation for some time and who is recognized as an expert on service station and sales room design and construction, will be general manager of the Argonaut corporation. Mr. Hickie's department will have full charge of acquiring sites in the various cities and will also design the buildings which are to be erected. An arrangement has also been entered into with Albert Kahn, Detroit, nationally known architect of business buildings. Mr. Kahn's organization will have supervision of construction work.

The corporation already has projected buildings under way in Detroit, Pittsburgh, Kansas City and Boston. It is also building in Chicago where a subsidiary corporation under the laws of Illinois was incorporated.

Besides providing direct factory branches for the various divisions, the realty corporation will also enter into agreements with distributors and with dealers, after they pass the necessary requirements, and will provide their plants for them.

First Class Highways Increased 19,492 Miles

WASHINGTON, July 20—A total of 19,492 miles of second class highways were converted and made into first class highways by the 48 states during 1926, according to figures just announced by the U. S. Bureau of Public Roads. The figure relates to state highway systems and not Federal Aid Highways.

During last year the total mileage of state highway systems was 287,928 miles, of which about 66 per cent is surfaced and regarded as Class A highways by the department.

Kelly Calls Citroen Semi-American Car

WASHINGTON, July 20—The Citroen, manufactured by Andre Citroen, of Paris, France, and produced at the rate of approximately 400 per day, is characterized as a semi-American car, in a report just made to the Department of Commerce by H. H. Kelly, automotive trade commissioner to Europe.

A large part of the items that go into the car are made and come from the United States, he says. Practically all of the specialized machines used in its production are American; its all-steel body is made under an American system from sheets imported from the United States; it is painted by an American process; most of the buildings are designed by American engineers. Withal the Citroen automobile as a finished product is a distinctly European car, small, light and low powered.

Hudson to Establish Berlin Assembly Plant

DETROIT, July 18—The Hudson Motor Car Co. is establishing an assembly plant at Berlin, Germany, as part of an extensive plan of extending its export business. The new plant will be in operation soon.

During the first half of 1927 the Hudson company manufactured 168,336 cars of which 127,651 were Essex, an increase of 35 per cent for this type over the corresponding period last year.

Paige to Extend Plant

EVANSVILLE, IND., July 16—New building contracts totaling more than $500,000 for the Paige-Detroit Motor Car Co., have been awarded to the M. J. Hoffman Construction Co.

The contracts listed in the Hoffman company contracts to date include a 600 x 80 ft. concrete and steel addition to the machine shops, a 200 x 80 ft. concrete addition to the warehouse section, and a 92 x 80 ft. addition to the garage.

Hayes-Hunt Purchase of Auto Body Seen

Financing Plan Practically Complete and Operating Plans Are Under Way

DETROIT, July 18—Indications are that the Hayes-Hunt Body Co. and the Central Trust Co. of Lansing, receivers for the defunct Auto Body Co., are nearer an agreement whereby the Hayes-Hunt interests will acquire the Auto Body Co. plant in Lansing.

Jay Hayes, general manager of the Hayes-Ionia Co., who was in Lansing for a conference with trust company officials on details of the transaction, stated before leaving for the East that his financing plan with one or two exceptions, was complete and he also has organized the managerial and production executive departments.

If the plant is acquired, approximately 600 men will be put to work at the start, producing bodies for Reo and other customers nearby. It is also possible that the Whippet business would be transferred from Grand Rapids to Lansing because of the shorter haul from Lansing to Toledo.

Reports Three Companies Seeking Wilson Property

MOLINE, July 18—Three large automobile companies are negotiating for purchase of the E. H. Wilson Mfg. Co., builder of automobile bodies, L. L. Harr, receiver for the corporation, announced this week at a meeting of a representative group of stockholders. Mr. Harr also stated that unless $300,000 in new subscriptions is raised this week he will be forced to apply to the Federal court for authority to close the plant and liquidate the company.

Failure to raise this fund or complete the sale deal will mean immediate closing of the plant. Mr. Harr said. Closing of the plant, however, would not affect the sale negotiations.

Tyree Plant Active

BLOOMINGTON, ILL., July 18—Approval of the financing plan agreed upon by the creditors and stockholders committee of the Tyree Auto Radiator Company was formally given this week at a general meeting of stockholders and new management of the plant has reported an actual gain in output and receipts under its control. June was reported to have shown an increase of 22 per cent over May and July business is running ahead of the two preceding months, despite the seasonal slackening normally occurring.

Monthly Rubber Statistics

WASHINGTON, July 16—Monthly production figures of world rubber production, showing the countries of origin, are to be issued henceforth by the Rubber Division of the Department of Commerce.

Cincinnati Sales Show Drop in June

New Car Business Declines 412 and Used Cars Fall 216 From 1926

CINCINNATI, July 18—Automobile registrations in Hamilton County for June show a falling off of 412 sales of new cars and 216 used cars as against figures for the same month last year. New car registrations were 1561 compared with 1973 in June, 1926, and 1896 in May, 1927. There were 4955 used cars registered against 5171 in June last year, and 5382 in May, 1927.

Since announcement of the new Ford car and many rumors concerning it, Fords virtually have been a drug on the market and this may be held responsible, to a great extent, for the slowing up of new car sales, for Cincinnati is distinctly a low-priced buying field. Chevrolet again led the field in Hamilton County by a wide margin, occupying this position for the ninth consecutive month. This puts Chevrolet well up in the low priced percentage table.

Nash got in late with new models but Nash sales showed a remarkable pick-up in the last few days of June. Reo also took a spurt, due chiefly to the new Wolverine which seems to have taken a firm hold in Cincinnati. Hupp, Oldsmobile and Packard also showed gratifying sales during the month in comparison with the same period last year.

Spokane Registrations

SPOKANE, WASH., July 16—Figures reported at Spokane, for Spokane county, for the first 27 days of June, indicate that for the second consecutive month the four leaders are: Chevrolet, first; Willys-Knight Whippet, second; Ford, third, and Hudson-Essex, fourth. Buick is in fifth place.

Wayne County Sales Lower

DETROIT, July 16—The passenger car sales in Wayne County for June totaled 6230 units and sales for six months are 31,670, compared with 45,532 for the corresponding months last year. Commercial sales in June totaled 536 and for the half 3242, compared with 4926 last year.

Servel Plant Resumes

EVANSVILLE, IND., July 12—The local plant of the Servel Mfg. Co., builders of commercial car bodies, resumed normal operations yesterday after a week's layoff for annual inventory, Fred P. Nehrbas, vice-president and general manager, announced. The commercial body building department, which is concentrating largely on Chevrolet bodies, is operating on a 100 bodies a day schedule with about 300 men on the payroll, Mr. Nehrbas reported.

Sees Northwest Sales Improved in Late Year

MINNEAPOLIS, July 16—According to the monthly review of business conditions published by the Northwestern National Bank here, sales of automobiles have not been as great in the Northwest as they were in 1926. It is the opinion that the peak of business which normally occurs in April and May has been deferred this year by backward weather, bad roads and other causes and that the 1927 peak will not be reached until later months.

Minnesota is believed to be the best selling territory at present with Montana and western Wisconsin not far behind. Sales in the Dakotas are spotted.

New Selden Truck Model Has De Luxe Type Cab

ROCHESTER, July 16—Selden Truck Corp. announces a new model known as Roadmaster Model No. 47. The new truck is of three-ton capacity, with six-cylinder 72 hp. engine and improved body lines. Not only is the appearance of the truck greatly improved but longer life and better service are assured through the use of heavier frames, springs and larger castings, shackles and brackets.

Special attention has been paid to the brakes, a new hookup being used which brings all four brake shoes into action with a single pressure on the service pedal. A propellor shaft brake is furnished as additional equipment upon request.

The new body improvements make the truck one of the most attractive jobs on the road, with high hood, streamlined body finished in flag blue with yellow wheels and striping. The de luxe cab is fitted for the utmost comfort and extra large door openings and narrow corner posts provide unobstructed vision for the driver. Regular equipment includes Ryan Ilco flat lights, dual rear pneumatic tires, automatic windshield cleaner and rear view mirror. All instruments in the cab, including dash type of heat indicator, gasoline gage, oil pressure gage, speedometer and ammeter are grouped in a center panel under glass with concealed lighting. Ignition and lighting switches are located on the steering post.

Selden Sales Gain 21%

ROCHESTER, July 18—W. G. Clay, sales manager of the Selden Truck Corp., reports truck sales for June were 21 per cent greater than for June, 1926. He attributes this to the warm reception given the new three-ton Roadmaster speed truck brought out this spring.

Few Repossessions Result from Flood

Finance Companies Foresee No Serious Situation—District Not Large Buyer

NEW YORK, July 18—Although finance companies are watching very closely developments in the flooded areas of the Mississippi, no serious situation has yet arisen and none is expected, a canvass of the leading companies revealed today. Slightly increased repossessions in the districts hit by the floods are in evidence but the number is not great enough to have any appreciable effect upon the business of the national companies.

The Mississippi farming districts adjoining the river never have been very large markets for automobiles and what cars were sold have been mostly Fords. Finance companies that do a considerable amount of Ford business are the ones that are most concerned in the present situation but even for them the proportion of business affected is very small.

Field men, district representatives and dealers in the flooded areas have kept close watch on the movement of cars on which unpaid balances exist, and in nearly all cases the precise position of the purchaser is known. Cases of delinquencies in monthly payments are being considered individually and no special policies for their handling have been instituted. Where it is believed that a purchaser will soon be in position to resume payments he is being allowed to keep the car.

Buick on Heavy Schedule

DETROIT, July 16—Buick Motor Co. during June turned out 17,000 cars, as compared with 20,000 in May. The July schedule calls for 23,000 to 24,000. The Oakland Motor Car Co. is now operating on a schedule which calls for 1000 cars daily. During the first six months of the year this company's production of Pontiacs and Oaklands was 100,000.

Stewart Sales Gaining

BUFFALO, N. Y., July 16—T. R. Lippard, president of the Stewart Motor Corp., states that the Stewart truck business continues to show a marked increase in sales throughout 1927 and there is every indication now that this will be one of the most profitable years in the history of the company.

Mueller to Expand Plant

DETROIT, July 18—Mueller Brass Co., Port Huron, announces that it will expend $1,000,000 in an expansion program. The plans call for the construction of several new buildings over a period of five years and the addition of 500 more workers. A parcel of land adjacent to the present plant has been acquired for the expansion.

Men of the Industry and What They Are Doing

Foreign Outlook Bright, Says Morse After Trip

According to E. C. Morse, director of export sales of the Chrysler Sales Corp., who has just returned from a five months' trip abroad, the outlook for the automobile industry in foreign markets is very bright, both in Europe and South America.

Mr. Morse sees great benefit from the visits of various South American delegations to the United States and also visits by parties of Americans to South America. He states that the disinterested "big brother" attitude of the United States has left a marked impression on Latin-Americans, bringing about a strong sentiment for better highway systems.

"The result is naturally a reflex benefit to the automobile industry," said Mr. Morse. Automotive exports have been increasing steadily and exports of automobiles from the United States to South America in the first four months of 1927 were more than 55 per cent of the total exports for the entire year 1926.

Mr. Morse announces the appointment of two important distributors for Chrysler cars in South America. Chrysler distribution in Argentina is now in the hands of Resta Hermanos, S. A., who has prepared plans for a building in Buenos Aires which will rank with the best equipped establishments in the world. At Sao Paulo, Brazil, Chrysler will be represented by Companhia Nacional de Automoveis, S. A.

Woods Resigns Sales Post

Ralph Woods has resigned as sales manager of Nice Ball Bearing Co., Philadelphia, effective Sept. 1. Mr. Woods has been connected with the company for the past 10 years, nine of which he was in charge of sales. Following his resignation, Mr. Woods plans a short vacation trip after which he will make an announcement of his future plans.

Accountants Honor Coapman

C. Walter Coapman, comptroller of the North East Electric Co., was elected vice-president of the National Association of Cost Accountants at the annual convention in Chicago recently.

Uehlinger Uses Plane

H. Uehlinger, vice-president of the Hilo Varnish Corp., is using air transportation in calling on the trade, visiting branch offices and making credit surveys.

Sloan on Railway Board

Alfred P. Sloan, Jr., president of General Motors Corp., has been elected a director of the New York, Chicago & St. Louis Railway (Nickel Plate).

Fire Destroys Models in Edison Laboratory

Thomas A. Edison, Jr., son of the inventor, sustained a loss of about $15,000 when fire destroyed his private laboratory in Orange, N. J. He had been carrying on experiments with internal combustion engines for use in airplanes and with fuel to be used in the engines. A number of models nearing completion were destroyed.

Marlette Zone Manager

George S. Marlette has been appointed zone manager of the Automotive Equipment Association Greater Market Development for the Southeastern States. He was formerly assistant director of sales of General Equipment Corp., Kalamazoo, and previous to this connection he had served in the accessory and equipment field as a salesman for Manley Mfg. Co. and as shop equipment manager for the Straus-Frank Co., San Antonio jobber.

Serrano Back from Abroad

E. H. Serrano, director of exports for Moon Motor Car Co., has returned from a three months' trip through Europe. Progress in road building is steadily opening the market for automobiles, and American cars are increasing in popularity, Mr. Serrano said. Lowering of tariffs in Germany is making conditions there very favorable for American car business, he said.

Name Sales Representatives

A. C. Chambers, formerly with Eaton Axle Co., and F. J. Burrows, formerly with Ferrot Machine & Foundry Co., have been named sales representatives of Bendix Brake Co. C. E. Taylor, consulting engineer of Detroit, has been named special engineering representative of the company. All will be located at the Bendix office in Detroit.

Harkless Joins Tool Company

M. J. Harkless has been appointed sales engineer of the contractors' department of the Independent Pneumatic Tool Co., Chicago. Mr. Harkless previously was an engineer of the railway and marine supply department of the Buda Co.

Kolb Joins Indiana

F. J. Kolb has been elected vice-president and manager of the Indiana-Pittsburgh Truck Corp., Pittsburgh factory branch of the Indiana Truck Corp. He formerly was manager of the Boston branch of Selden Truck Corp.

General Motors Export Adds Two to Personnel

Two additions to the General Motors Export Co. organization are announced, A. M. Wade, formerly advertising manager of the Connecticut Light & Power Co., joining the advertising division, and J. P. Goodyear, formerly with the Robbins & Myers Co., joining the general manufacturing department. Mr. Goodyear, after a short stay at the New York office, will sail for Melbourne.

W. T. Whalen, general manager of the export company, is in England on a business trip. W. O. Kennington, formerly managing director of Delco-Remy and Hyatt, Ltd., London, has been transferred to the staff of the regional director for Europe.

Branch Managers Change

J. C. Rowold, formerly branch manager for Mack-International Motor Truck Corp., at Miami, Fla., is now branch manager at Charlotte, N. C., and R. W. Huffman, manager at St. Petersburg, is advanced to the Miami branch, with W. N. Costello appointed to the St. Petersburg managership.

Shuart Named Director

John D. Shuart, treasurer of the Springfield Glazed Paper Co., Springfield, Mass., has been chosen a director in the Indian Motocycle Co. to fill the vacancy caused by the recent resignation of Frank J. Weschler, former president of the Indian.

Scharps on Maine Trip

C. E. T. Scharps, formerly advertising manager of the Chrysler Corp. and now with MacManus, Inc., stopped off in Boston on his way to Maine for a short camping trip with some friends. He dropped in to pay his respects to Charles E. Fay, Boston Chrysler distributor, and members of the organization.

Bonney Promotes Wixson

W. W. Wixson of Bonney Forge & Tool Works, Allentown, Pa., who has been with the organization for a number of years, has been appointed district sales manager of the central district.

A. R. Kroh

DETROIT, July 18—A. R. Kroh, died at his home in Oswego, Ill., July 11, following a short illness. For a number of years he was on the staff of the National Automobile Dealers' Association and appeared for them in practically every state of the union. For the last year he was on the staff of the Minneapolis Tribune. He also was identified with the sales promotion departments of Chevrolet Motor Co. and Goodyear Tire & Rubber Co.

Cleveland Makers in Big Civic Show

Automotive Products Have Leading Part in Display of Ohio Industry

CLEVELAND, July 20—Automobiles, parts, supplies and equipment will make a considerable section of the mechanical division at the mammoth Ohio-Cleveland Industrial Exposition, which opens here Aug. 6 for a run of three weeks. White Motor Co., Willard Storage Battery Co., Winton Engine Co., and Fisher Body Ohio Co. are some of the leading manufacturers in the automotive field, who will put their products on display.

For 23 days this exposition will present a graphic picture of the industrial and civic greatness of northern Ohio, of which Cleveland is the metropolis and chief trading center. Industry will dominate the exposition by sheer weight of numbers and from the fact that its 12,000 mills and factories pay 1,000,000 wage earners $1,500,000,000 each year for aiding in production of its $6,000,000,000 of manufactures.

In addition to those companies above mentioned these nationally known companies in the automotive field have reserved large exhibition spaces for displays of their products:

American Coach & Body Co., Chandler-Cleveland Motor Corp., Cleveland Worm & Gear Co., Columbia Axle Co., Eaton Axle & Spring Co., Jordan Motor Car Co., Baker-Raulang Co., Leece-Neville Co., M. & M. Co., Murray-Ohio Mfg. Co., Ohio Truck Body & Wagon Co., J. L. Owens (Garage), Peerless Motor Car Corp., Gustave Shaefer Wagon Co., Westinghouse Electric Co., White Motor Co., Winton Engine Co., Willard Storage Battery Co.

S. A. E. Votes Change in Nominating Form

NEW YORK, July 18—The amendment to the constitution of the Society of Automotive Engineers relative to the personnel of the nominating committee, has been adopted with 706 favorable votes out of 754 cast. The amended paragraph is as follows:

"The annual nominating committee of the society shall consist of one member of the society to be elected from and by each section of the society prior to the annual meeting; and three members of the society who shall be elected at the business session of the annual meeting preceding the annual meeting at which officers are to be elected; no two of said members shall reside in the same section district."

Paige Gains Over May

DETROIT, July 16—Paige production for June was 1552 cars compared with 1507 in May and 2748 Paige and Jewett cars in June last year.

Bud Grafting Brings Higher Rubber Yield

NEW YORK, July 20—Scientists in the Dutch East Indies have developed a system of bud grafting by which the yield of a rubber tree may be increased four-fold. Single trees ordinarily yielding three or four pounds a year may be made to produce 70 lb., experiments have shown. Yields from bud grafted areas have been from 800 to 5000 lb. per acre while the average yield under present conditions is not more than 320 lb.

The grafting process is based upon the assumption proven by Burbank that the characteristics of the mother tree are carried on by the bud. The buds from exceptional yielding trees are grafted to other trees.

American Rolling Mill Buys Columbia Steel

NEW YORK, July 20—American Rolling Mill Co. has acquired the Columbia Steel Co. and the Forged Steel Wheel Co. in a deal involving approximately $20,000,000, payment to be made in securities of the purchasing company on an exchange basis.

This transaction follows the cooperative development by the Columbia and American Rolling Mill companies of a new process for the manufacture of steel sheets in strip form. The former has perfected its Butler, Pa., plant for the production of continuous strip sheets which could be cut in any desired length. The latter has been producing sheets in strip form about eight feet long at its Ashland, Ky., plant. American Rolling Mill will now control both processes.

President G. M. Verity of American Rolling Mill said the purchase brings together the two outstanding developments covering the only known means of a purely mechanical operation in the manufacture of sheet metal, either sheets or strips. Armco will control at least 1,000,000 tons a year of finished products. The entire product of the two companies will be sold by Armco.

Shaler Opens Detroit Office

DETROIT, July 18—The Shaler Co. of Waupun and Milwaukee, manufacturers of Shaler vulcanizers and automobile locks, has opened an office in the General Motors Building, with K. L. Clark as local representative.

Hudson Builds 1821 in Day

DETROIT, July 19—A new production record was set by the Hudson Motor Car Co. on July 13, when 1821 Hudson and Essex cars were built and 1902 cars shipped.

Nature Continuing Formation of Oil

Scientist Says Natural Process Probably Duplicated in Recent Discovery

STATE COLLEGE, PA., July 19—The natural formation of petroleum is not a thing of the past said Dr. Hans Tropsch of the Kaiser Wilhelm Institute, Manheim-Ruhr, Germany, in an address before the Institute of Chemistry of the American Chemical Society here. Nature's most likely methods in making petroleum are probably duplicated in the recent discovery of the method of its synthesis from water gas, he said.

"Any of the ordinary fuels whether of high or low grade, can be converted into gases," Dr. Tropsch declared, "either water gas, a mixture of hydrogen and carbon monoxide obtained by heating carbon in a current of steam, or natural gas such as methane, ethane and others. Either natural gas or water gas can be used as a starting point for the preparation of gasoline, naphtha, lubricating oil or paraffin wax by the recently discovered catalytic processes. These processes are similar to those in operation in Germany, France and the United States for producing wood alcohol, formerly made exclusively from wood, and in Germany for the manufacture of 'synthol' which is proving satisfactory as a motor fuel."

Dr. Tropsch pointed out that in the industrial production of synthol, or synthetic gasoline, no refining process of any sort is necessary. In the present petroleum practice, the removal of sulphur from gasoline has been estimated to have cost American motorists about $50,000,000 per year.

Following his summary of the processes in the graduation of synthetic gasoline, Dr. Tropsch concluded:

"There are, therefore, indications existing from which we can conclude that at least part of the natural crude oil was formed inorganically with the help of catalysts. From this possibility we may conclude that even today, under favorable conditions, crude oil is formed other than from animal residues."

Mack Bus Sales Double

NEW YORK, July 18—Deliveries of Mack buses in the second quarter more than double those in the first quarter, according to R. A. Hauer, vice-president of Mack-International Motor Truck Corp. The general increase for the quarter was 137 per cent, with a gain of 165 per cent in deliveries to traction and steam railroad companies.

Chandler Signs Dealers

CLEVELAND, July 18—Chandler-Cleveland Motors Corp. reports the signing of 26 additional dealers in the United States and Canada.

Steel Operations on Low Schedules

Price Situation Generally Firm But Buying at New Levels Meagre

NEW YORK, July 21—What little dent in steel mill output has been made by recent high temperatures is hardly much of a factor in the present condition of the steel market. While in the case of a few units the heat wave was responsible for temporary suspensions of operations, and curtailment in production to some extent was more or less general in the industry, there is so wide a gap between capacity and the rate of operations which the limited demand warrants, that the temporary deficit in output can be readily made up.

Sheet rollers continue to emphasize price maintenance, but if there have been any really representative sales at the new prices, such corroborative evidence has been kept under cover. The sheet-bar market furnishes a key to the outlook. About six weeks ago it was intimated that third-quarter sheet bar prices would be advanced from $34 to $35. Instead of hardening under the influence of this forecast the market turned soft, some sales at $33.50 following.

This price was considered out of line with the higher prices asked for sheets, but an out-and-out advance to $35 might again unsettle the whole price structure and so the third-quarter market was established on a firm $34 basis. To a considerable extent the sheet-bar mills control the sheet price situation, and they are apparently determined that the sheet-rollers shall have the opportunity to establish the market on the basis of the new prices which, however, still lack the essential test of representative sales.

Full-finished automobile sheets move in relatively small tonnages, but at full prices. Certain it is that the frequently repeated assertion of sheet producers that the new price levels are being strictly adhered to has prevented the market from slipping, as has been the case in other steel products, cold-finished steel bars for instance.

Tonnage Concessions Granted

Not so many weeks ago, an attempt was made to lift the price for cold-finished steel bars to 2.40 cents, and small buyers paid that level for a time while the larger automotive consumers bought at 2.30 cents. When the smaller buyers succeeded in obtaining cold-finished bars at 2.30 cents, the larger consumers insisted upon a differential concession for tonnage, and the market now is 2.20 cents for round tonnages and 2.30 cents for smaller quantities.

Pig Iron—The market for foundry and malleable iron is easy, with competition in some markets so keen that automotive foundries are perplexed by the wide range of quotations and prefer to wait for a more settled condition before committing themselves.

Aluminum—While imports are well below those of last year, they are comparatively heavy when lessened demand and heavy warehouse stocks are taken into consideration. The price situation shows no change. In the "outside" market virgin metal is obtainable at one-half cent per pound under what is commonly regarded as the domestic producer's price. Three of the largest German producers of aluminum alloys are reported to have set up a joint working agreement.

Copper—While there has been no marked expansion in the demand, a much better feeling prevails and prices rule firm.

Tin—The market is stronger, London having chalked up higher prices.

Lead—Following good buying by storage battery makers, the market has turned more quiet but firm.

Zinc—Prices are slightly higher and consuming demand has improved.

Prisons to Reform Bootlegger Cars

DETROIT, July 14—The value of reconditioning automobiles before offering them for sale has made such a profound impression upon Governor Fred W. Green, of Michigan, that he has convinced the state administrative board that all cars seized from bootleggers in the future should be reconditioned in state prisons before being offered for sale. To carry out the new plan, when confiscated cars are released by the courts, they will be turned over to the state prison commission for rebuilding.

Copper Output Increased

WASHINGTON, July 12—Copper production in the United States during 1926 totaled 2,048,065,270 lb. of which 12.7 per cent was used by the automobile industry, according to survey just announced by the U. S. Bureau of Mines. The 1926 production was 4 per cent more than the 1925 production and marks a new peace-time record of production. Michigan shows a gain of 27 per cent in production, compared with 1925.

To Make New Accessory

ST. PAUL, July 18—Rainbow Mfg. Co. has been formed here, to make a windshield antiglare device. Horace G. Whitmere and J. W. Hulme are the officials. It is planned to make accessories later.

Organize Piston Company

DETROIT, July 18—American Piston & Machine Co., Alpena, has been incorporated under the laws of Michigan with a capital of $75,000. The company will manufacture pistons and will deal in general repair work.

Hardwood Demand Holds High Level

Orders Mainly for Current Requirements—Flood Conditions Hold Prices High

ATLANTA, July 18—Hardwood wholesalers and manufacturers in the Atlanta lumber market state that sales to the automotive and truck and commercial body trades the first 10 days of July have held up better than had been anticipated, and that business is not only better than for the same period last year but shows a good gain over normal.

The orders are mainly for current needs of the manufacturers with prompt shipments wanted in most cases, but they are larger than they usually are where the trade is keeping close to its needs. It is not thought that there will be any advance orders to speak of placed while prices remain at the present high levels, and it is unlikely that there will be any appreciable declines in the quotations until the hardwood mills of the lower Mississippi Valley are producing again on an active basis.

The primary call is for thicker dimensions of white ash and maple in the best grade, with a fair call for No. 1 and select ash and some call for maple and elm. Prices as a whole are around $8 to $12 higher than they were before the Mississippi floods.

Business Asked to Help in Revising Tax System

WASHINGTON, July 16—An appeal to business organizations in the United States to cooperate with the Congressional Joint Tax Committee in the involved task of overhauling and perfecting the Federal tax system has been made by the Chamber of Commerce of the United States in a communication sent to its 1500 member organizations.

Business, the National Chamber asserts, has a direct interest in the systematic revision of the Federal revenue system.

Mullins Adds New Line

SALEM, OHIO, July 16—Mullins Body Corp. is developing a new line of products which gives promise of becoming an important part in the output. Radiator enclosures and shields, ornamental in design and steel stamped, are being produced and the company has taken a two-year lease on the plant of the Silver Mfg. Co., to develop this part of the business.

Coggswell to Add Tester

SPRINGFIELD, MASS., July 18—Coggswell Mfg. Co. will soon extend its automotive line by bringing out a new device for the testing of brakes. Additions also are being made to the concern's list of small tools and radio products.

Employment Shows Gradual Recession

Department of Labor Survey Finds Industry Affected by Seasonal Slowness

WASHINGTON, July 18—A gradual recession of employment in the automobile and rubber industries, with several factories curtailing their forces, while others in the vicinity of Detroit are reported working full and some overtime, is reported to the U. S. Department of Labor in the July survey of labor conditions throughout the United States. In the main the department finds a considerable reduction of automobile workers, due to the seasonal decline.

In the rubber industry the decrease in workers is of about the same proportion as that in the automobile industry and is attributed in the main to the same seasonal decline in the business of the automobile manufacturers.

The telegraphic reports from the principal automotive centers are as follows:

Michigan—Activities in the automobile industry have been curtailed somewhat.

Detroit—Employment has receded approximately 10 per cent during the past 30 days. The surplus of labor includes a small number of semi-skilled workers and a larger surplus of automobile factory labor. Several plants manufacturing automobile parts are temporarily closed.

Grand Rapids—Automobile body and automobile accessory plants are working with night forces.

Flint—Several departments in the larger automobile plants are working overtime. All other automotive plants are operating on full time basis.

Lansing — Surplus of automotive labor. All plants running, one motor company operating part time.

Muskegon—There is a small surplus of workers in plants related to the automobile industry.

Jackson—A slight decrease in automobile accessory plants in July.

Ohio—The rubber industry has released a large number of men.

Cleveland—The automobile plants are reducing forces, which is reflected in rubber manufacturing plants.

Akron—Some departments in rubber plants reducing forces.

Sandusky—Rubber plants are operating overtime.

Sets Six Months Record

LANSING, July 18—The Michigan Screw Co. enjoyed the biggest six months business in its entire history during the half-year closed June 30 and the books show three times as many accounts as the company possessed a year ago. Because of the pressure of business the company is eliminating its annual vacation shutdown.

Michigan Car Exports $37,660,731 to April 1

WASHINGTON, July 20—Exports of passenger cars from Michigan for the first three months of this year amounted to $37,660,731, and ranked first of any state in automotive exports, according to figures just announced by the Department of Commerce. New Jersey, ranked second, exporting $3,759,143 worth of passenger cars. Truck exports from Michigan were $9,397-117; from New Jersey, $2,270,-324.

Ohio ranked third as an exporter of passenger cars with a total of $3,233,774. Indiana was fourth with exports of $3,-096,773. Ohio ranked first in tire exports for the quarter, the total being $5,988,645.

Shipments to France Show Sharp Decline

WASHINGTON, July 18 — Due largely to the industrial crisis in France, which began late in 1926, the Department of Commerce is advised that automobile imports, largely American exports, show a very material decline during the first quarter of this year compared with 1926. The actual figures show imports this year's period to be 731.8 tons, compared with 6091 tons for the same period of 1926.

Automobile exports have suffered less than the imports. Exports of cars and parts during the first quarter of 1927 amounted to 26,808 tons, as compared with 22,091 tons in the first quarter of 1926—an increase of 20 per cent in weight. In value, however, the exports show a decrease of 27 per cent.

360,000 British Owners Ask for Change in Tax

LONDON, July 5 (*by mail*)—A motorists' petition, sponsored by the Automobile Association and signed by over 360,000 car owners, has been presented to Parliament asking that proceeds of motor taxation be applied to road purposes only; that license fees be reduced if present rates provide more funds than are necessary for road purposes, and that a roads department, with a representative in Parliament, be maintained.

N.A.D.A. Sounds Tax Call

CHICAGO, July 16—The N.A.D.A. has sent out a call for cooperation from the industry to bring influence to bear upon members of Congress to the effect that automotive tax repeal may be favorably considered by the House ways and means committee which meets Oct. 31.

Postoffice Awards Contract for Bodies

Eagle Wagon Works Bid of $192.60 Accepted—Bids Ranged to $435

WASHINGTON, July 18—Bidding on identically the same specifications, a wide range of bids has been received by the Post Office Department from 19 automotive manufacturers, for 300 standard five-eighths-ton mail truck bodies. The lowest bid was $192.60 and the highest was $435. The contract will be awarded to the Eagle Wagon Works, of Auburn, N. Y., the lowest bidder.

The department announces that with the acquisition of the new bodies, which will be placed on government owned chassis, that it will have a total of 6350 automotive units in the mail service. The concerns submitting bids and their figures are as follows: (the price quoted is for mounted truck bodies and unmounted, respectively) :

Eagle Wagon Works, Auburn, N. Y., $192.60 and $184.80; Millspaugh & Irish Corp., Indianapolis, $435 and $425; Mason Mfg. Co., Newport News, $207.50 and $197.50; Fort Smith Body Co., Fort Smith, Ark., $253.50 and $243.50; Hackney Bros., Inc., Wilson, N. C., $242.60 and $242.60; Patriot Mfg. Co., Haverlock, Neb., $345.34 and $345.35; Kratzer Carriage Co., Des Moines, $299.17 and $282.26; Kramer Wagon Co., Oil City, Pa., $307.92 and $299.42; Arcadia Truck Body Corp., Newark, $398 and $392.

Weatherproof Body Corp., Corunna, Mich., $228.40 and $221.40; H. H. Babcock Co., Watertown, $385 and $360; Biehl's Wagon & Auto Body Works, Reading, $275 and $260; Fox-Springer Corp., Richfield Springs, N. Y., $347 and $333.50; Kentucky Wagon Mfg. Co., Louisville, $284 and $269; Defiance Carriage & Body Co., Defiance, Ohio, $205 and $197; American Body Co., Grand Prairie, Tex., $268 and $268; Anheuser-Busch, Inc., St. Louis, $319.70 and $310.50; Ford Body Co., Greensboro, N. C., $230.50 and $220.50, and General Body Co., Defiance, $219.91 and $209.93.

Sao Paulo Buys 50 Buses

WASHINGTON, July 18—Plans are under way by the Light & Power Co. of Sao Paulo, Brazil, for the extension of local transportation service in that city. The company has submitted and had approved a period of development to cover five years, to expend $10,000,-000 in transportation facilities there. Among the improvements mentioned is the acquistion of 50 new omnibuses at once with necessary garage space.

Velie Adds Dealers

MOLINE, July 16—Velie Motors Corp. added three distributors and 26 dealers during June.

Tire Inventories Higher on June 1

Shipments and Production Run Lower Than Previous Month in Most Classes

NEW YORK, July 18—Increased inventories of all types of casings and inner tubes, except high presure inner tubes, are shown as of June 1 in the monthly report of the Rubber Association of America, Inc. Shipments and production are lower in all classes except high pressure cord casings. Comparisons follow:

	Inventory	Production	Shipments
Pneumatic Casings—All Types			
May, 1926	9,257,403	3,767,546	3,908,328
Apr., 1927	9,091,787	4,724,748	4,276,464
May, 1927	9,346,581	4,613,945	9,243,078
Inner Tubes—All Types			
May, 1926	15,855,372	4,611,917	4,278,215
Apr., 1927	13,351,406	5,529,936	4,769,385
May, 1927	13,792,496	5,053,018	4,605,277
Balloon Casings			
May, 1926	3,100,464	2,084,687	1,823,411
Apr., 1927	3,794,709	2,741,841	2,417,926
May, 1927	4,106,840	2,708,350	2,337,572
Balloon Inner Tubes			
May, 1926	4,449,433	2,488,625	2,159,744
Apr., 1927	5,302,394	3,131,335	2,492,473
May, 1927	5,830,272	2,907,364	2,342,781
High Pressure Cord Casings			
May, 1926	4,868.505	1,492,951	1,848,177
Apr., 1927	4,674,295	1,923,402	1,773,314
May, 1927	4,685,780	1,867,667	1,805,930
High Pressure Inner Tubes			
May, 1926	11,405,939	2,123,292	2,568,471
Apr., 1927	8,049,012	2,398,601	2,276,912
May, 1927	7,962,224	2,145,651	2,262,496

British Patent Process for Rubber Protection

WASHINGTON, July 20—A process for the protection of rubber against the effects of oxidation and actinic light, and which is regarded by the Department of Commerce, as being of interest to the automobile and tire industries, has been patented in England by B. D. Porritt and T. R. Dawson, according to word received by the department from American Trade Commissioner H. S. Fox. The patentors are members of the Research Association of the British Rubber and Tire Manufacturers.

It is stated that previous processes for the preservation of rubber from oxidation by the oxygen of the air, and the deleterious effects of the actinic rays of light have been based on methods designed to check oxidation and its effects, or by methods intended to protect against actinic and ultra-violet light. The present process differs in that it consists in the application to all classes of goods containing rubber or made of rubber, of combinations of small amounts of substances which protect the rubber.

Gets Gasoline Gage Patent

WASHINGTON, July 20—Patent No. 1,663,672 has been issued to Lewis A. Mapel covering an apparatus said to be an improvement in an indicating instrument for determining the fluid level in automobile tanks, wherein the splash action of the liquid indicates the amount of gasoline in the tank. Mr. Mapel applied for the patent in 1920, and it was first denied but now has been allowed, the board of examiners on appeal finding that certain new principles were involved making his invention patentable.

Aluminum Users Urged to Develop Processes

WASHINGTON, July 20—American manufacturers who are large users of aluminum are urged in a statement just made by the U. S. Bureau of Mines to develop processes that will free them from dependence on foreign sources for beauxite, used in aluminum manufacture. The automobile industry is one of the largest consumers of this commodity, using last year 50,000,000 lb. of the total 200,000,000 lb. production, or 25 per cent.

A brochure, Bulletin 267, has been prepared by the government's metallurgists, making suggestions as to how this may be done. Copies may be had by writing to the Superintendent of Documents, Government Printing Office, Washington, and enclosing 35 cents to cover cost of printing and mailing.

Martin Gets Navy Order

CLEVELAND, July 18—An order for 54 bombing planes incorporating a radically new type fuselage construction has been awarded by the Navy Department to the Glenn L. Martin Co. These planes are said to have the lightest empty weight per pound of carrying capacity of any ships of their general type in existence.

Replacement Sales 40% of Production

Department of Commerce Bases Figure on World Registration Changes

WASHINGTON, July 20—What percentage of automobiles sold in the United States are for replacement purposes? What for the rest of the world?

The answers to these two questions have been made the basis of a study by the automotive division, U. S. Department of Commerce. The answer to the first question, the department finds, is that one out of every two cars bought in the United States is to replace a discarded car. For the rest of the world, two out of every five cars, or 40 per cent of the world's production, were used to replace old automobiles in 1925.

2,030,456 Retired in 1926

World production in 1925 is placed at 5,091,474 automobiles. The number of vehicles in use increased only 3,061,018, therefore 2,030,456 cars, or 40 per cent of world production, replaced cars worn out or retired from service during 1925, the department finds.

Sales of automobiles in the United States for replacement totaled 1,850,838 vehicles, or 47 per cent of the consumption in 1926. Replacements in Canada in 1926 accounted for about one-fifth. The total replacement sales were 30,285, while the increase in registration of automobiles was 112,956. A large part of the 1926 Canadian sale was in the western provinces.

Improved De Lavaud Automatic Transmission Shows Reliability in Paris Demonstration

PARIS, July 10 (*by mail*)—Claiming that his torque converter has now been developed to a stage where it can be put into production, M. Sensaud de Lavaud this week gave demonstrations of a convincing nature to representatives of the French press. Experimental work on the Sensaud de Lavaud automatic transmission has been carried on uninterruptedly for the past six years, about a dozen cars being on the road in France and three in the United States in the hands of one of the biggest manufacturers of low-priced automobiles.

While the results were promising, various minor defects developed in strenuous service, but it is claimed that these have now been completely eliminated and that the mechanism is perfectly reliable and, as now designed, is as cheap to produce as a normal transmission and rear axle.

The public demonstrations in Paris were made with a converted Voisin chassis having a sleeve-valve engine of 94 cu. in. piston displacement. Fitted with four bucket seats, this car repeatedly carried 10 to 12 newspaper men up a 20 per cent gradient, stopping and restarting on the hill, and making the run both at a crawl and at high speed. After several runs in this way, the Voisin with 11 persons aboard climbed the gradient towing a light car with four passengers.

M. De Lavaud demonstrated the ease of handling this car by climbing the gradient with four passengers, then jumping off the car, walking by its side for 50 yards and on getting back to his seat accelerating rapidly. It was proved possible to stop the car from the road by cutting off the ignition and to start away again merely by the use of the clutch. The self-jamming cams which form an essential part of the transmission made it unnecessary to hold the car by the brakes. It is claimed that with the transmission adjusted for this type of hill climbing the car had a maximum speed on the level of rather more than sixty miles an hour.

Insurance Meets Aviation Growth

Comprehensive Coverage Now Available for All Personal and Property Risks

BOSTON, July 18—The insurance business has discovered a new field. Since the successful ocean flights insurance underwriters have evidenced a pronounced concern in the matter, for on the extent and character of the indemnity they are able to supply will depend in no small degree the future development of aeronautics, says a statement issued here.

The general public does not realize this, but unless adequate protection of the property of air transportation companies can be had through insurance, there can be no extended development of commercial air travel.

With this idea in mind the insurance companies have been working for several years past to keep their various forms of coverage abreast of aeronautic development, with the result that today comprehensive aviation coverage may be had which embraces liability for loss from fire, lightning and transportation; accidental damage, theft, robbery and pilferage, public liability, passenger liability, property damage, tornado, cyclone and windstorm. Under separate contracts indemnity may be had covering personal accident, cargo risks, compensation and employer's liability.

The customary maximum liability assumed for accidental damage to the aircraft through fire or theft is $47,500; that for personal accident, $75,000 for any one person, and for cargo, $25,000 for any one consignment.

Professional aviators or those traveling as passengers may obtain life insurance from one company at least in amounts up to $50,000 on a single risk. In cases of this kind the regular life insurance rate is charged plus a loading for the additional hazard.

Branch Changes Name

LOS ANGELES, July 18—The Frank M. Cobbledick Co. has changed the name of its branch here to the Edward D. Maltby Co., continuing without change of policy or lines as direct factory distributors of automobile and industrial ball and roller bearings.

Signs Export Agent

CHICAGO, July 18—Chas. F. Elmes Engineering Works has made arrangements with Paul H. Peterson, New York, for the handling of its machine tool sales in all territory outside of the United States.

Increases Plant Capacity

KALAMAZOO, July 16—Kalamazoo Malleable Iron Co. has just completed two additions to its plant to provide more capacity and additional floor space for some crowded departments. New air compressing, sand blasting and hydraulic pressing equipment has also been added. Recently appointed officers of the company are C. J. Edwards, president and general manager; T. R. Collins, assistant general manager; James Linklater, works manager.

Rural Mail Routes Reach 44,784 Total

WASHINGTON, July 20—The growth of the rural mail service from Oct. 1, 1896, when the first rural route was established, up to the present time is made the basis of a survey by the Post Office Department and just announced here. The automobile is characterized as the factor which has extended the service, largely, so that at the present time there are 44,784 routes, serving 31,000,000 individuals daily, at a cost of $104,600,000 annually.

The department figures that the cost of rural service per mile per annum for the first 24 miles is $75; the cost per mile thereafter being $30. Because of the automobile, the original 24-mile route has been lengthened to an average of 50 miles, and because of the lengthening of the routes the department is saving about $1,000,000 annually.

The condition of roads traveled by rural carriers forms a problem which confronts the department at all times. The survey shows 25 per cent of the roads traveled by rural carriers are hard-surfaced roads, 50 per cent are good dirt roads and the other 25 per cent are ordinary dirt roads.

Ford Dealer to Get "Demonstrator" Plane

DETROIT, July 16—A new three-motored, 12-passenger Ford transport type monoplane will leave the Ford Airport early next week for the Pacific Coast. It goes to Jack Maddox, Los Angeles Ford dealer, for use as a "demonstrator." A feature of the trip will be a flight over the Grand Canyon, arranged for by the recently organized National Parkways Syndicate.

Indiana Sales Gain 25%

MARION, IND., July 18—Indiana Truck Corp. reports an increase in orders in June over May of 25 per cent, and an increase of 80 per cent over June, 1926. Reports received from its factory branches and distributors indicate a continuance of large business in July.

Opens Office in Newark

NEW YORK, July 16—Ingersoll Rand Co. has announced that it has opened a branch office at 236 High St., Newark, under the direction of F. K. Armstrong, to provide better facilities for its customers in northern New Jersey and adjacent counties of New York.

Financial Notes

Seiberling Rubber Co. reports sales for the first half of this year totaling $7,298,011 and net earnings of $826,958, after interest, depreciation and all charges except Federal taxes. After setting aside $50,000 for contingencies and after payment of preferred dividends, $796,958 was added to surplus. In the corresponding period of 1926, sales totaled $6,616,652 and net earnings $182,235.

Electric Auto-Lite Co. and subsidiaries for the six months ended June 30, 1927, reports profit of $1,819,905 before Federal taxes, but after interest, expenses, etc. This compares with $1,201,877 in the same period of 1926. Profit in the June 30 quarter was $1,043,956 before Federal taxes against $530,658 in the second quarter last year.

Midland Steel Products Co. reports second quarter earnings of $742,309, after all charges but before Federal taxes, comparing with $603.048 in the preceding quarter and with $696,592 for the second quarter last year. Earnings in the first half were $1,345,367 before Federal taxes, as against $1,464,687 in the first half of 1926.

Gabriel Snubber Mfg. Co. in a statement of June 30, shows current assets of $2,402,702 against $1,710,255 on Dec. 31, 1926, and current liabilities of $593,441, as against $279,240. Surplus advanced from $981,300 to $1,470,372. Cash and Liberty bonds totaled $1,587,829, a gain of 53 per cent.

Borg & Beck for six months ended June 30, 1927, report net profit of $517,107 after all charges and Federal taxes, equivalent to $4.48 a share (par $10) earned on 115,000 shares of stock. This compares with $454,738 or $3.63 a share on 125,000 shares outstanding in first six months of 1926.

Mullins Body Corp., for the six months ended June 30, 1927, reports net profit of $287,860 after all charges and Federal taxes. This compares with $149,728 before Federal taxes in the first six months of 1926. Net profit in June was $43,338 and for the June quarter, $149,039.

General Electric Co. sales in the first half of 1927 totaled $149,795,026, which compares with $147,450,867 for the first half of 1926. Profit available for dividends on the common stock for the six months of 1927 was $22,542,972, compared with $19,000,392 for the 1926 period.

Central Alloy Steel Corp. reports net profit of $1,244,670 for the second quarter this year, after charges and Federal taxes, as compared with $592,442 in the first quarter. Net profit for the half year was $1,837,112.

Marvel Carburetor Co. reports net income of $326,888 for the first half of 1927, after all charges and taxes, equal to $4.36 a share. Dividend requirements for the full year are $3.20 a share.

Gardner Motor Co., Inc., reports for the six months ended June 30, 1927, profit of $140,958, after depreciation and charges but before Federal taxes.

Motorcycles Show 20% Growth in 1926

WASHINGTON, July 20—A world-wide census of motorcycles in use as of Jan. 1, 1927, just announced by the automotive division, U. S. Department of Commerce, shows a total of 1,726,-241, representing a gain for the year of 20.4 per cent. Of the total world registration, 32 per cent are of American make.

The growth of the motorcycle industry during the year, the department points out, was faster than that of the automobile industry, which increased but 15 per cent in 1926 over 1925.

The greatest number of motorcycles are in Europe, the United Kingdom leading in registration, Germany second, France third and United States fourth. The 1926 production was 334,000 units, an increase of 25 per cent over 1925.

Patents Reinforced Tube

WASHINGTON, July 20—A patent for the construction of an inner tube reinforced with wire has been granted by the United States Patent Office to Daniel M. Weigel, under patent No. 1,633,963. The patent was applied for Aug. 20, 1921.

The principle of the invention resides in the provision of an inner tube in which are embedded a plurality of layers of wire helicoidally wound in opposite directions separated by rubber so as to prevent the crossed wires from touching one another.

Revoke Horsepower Tax

WASHINGTON, July 18—A royal decree which went into effect on July 1, taxing automobiles $5.78 per horsepower per year in the Canary Islands, has been repealed, according to cable to the Department of Commerce. Had the decree been permitted to stand it would have placed American cars at a disadvantage with European makes of machines, the average American car running from 19 to 30 hp. compared with 10 to 15 hp. for European cars, the department declares.

New England Boosters Stage Outing August 9

BOSTON, July 18—At a meeting of the outing committee of the New England Boosters Club, No. 1, plans for the annual gathering were approved and notices were ordered sent to the members, and to other clubs. It is to be held at Long Island, Me., Aug. 9, and arrangements have been planned to take care of 300. The New York Boosters are asked to send reservations at once to the committee so that they may be taken care of on the trip from Boston to Portland and return.

The committee in charge of the outing comprises Eric J. Peterson, chairman; Al Fraser, secretary and treasurer; President J. R. Dade, Charles Foster, Stanley Stowers, Joseph Greenman, Earl Harvey, Walter J. Sullivan, Charles Swanholm and W. A. Snead.

Only Two States Left Without Gasoline Tax

CHICAGO, July 16—The 2c gasoline tax in Illinois goes into effect Aug. 1. At that time there will be only two states remaining on the list of those without a gasoline tax—New York and Massachusetts. Increases in taxation of 1c a gallon have recently been put into effect in Iowa, South Dakota and Pennsylvania.

Britain Gets Preference

WASHINGTON, July 18—The import duty of 10 per cent on all automotive products imported into the British West Indies has been repealed by that government, in so far as it relates to goods and parts made wholly of British materials by British labor. The order went into effect April 29, the U. S. Department of Commerce is advised.

Georgia Plans Tax Based on Weight

ATLANTA, July 16—A bill introduced before the Georgia State Legislature, now holding its regular bi-ennial session in Atlanta, will completely change the present system of registering motor vehicles if passed, in that motor license costs, instead of being computed by horsepower as at present, would be computed by the weight of the car. Passenger cars for private use would pay $5 plus 40c per 100 lb. gross weight of the car with a minimum charge of $11, while passenger cars used for hire would pay $5 plus 80c per 100 lb. gross weight of the car. Weight would also be the basis in the registering of motor trucks, and under the system proposed license costs would range from $15 to as high as $240 per year.

Another bill is also being introduced which would tax motor cars and trucks according to their gasoline consumption, issuing stamps similar to those used in the levying of tobacco taxes, the car owner to buy these stamps at gasoline stations, paying so much for each gallon of gas the car used.

Jersey Tax Law in Effect

TRENTON, N. J., July 16—Taking effect on July 1, a new law passed at the last session of the New Jersey legislature levies an excise tax of three-quarters of one cent for each half-mile of New Jersey highways used by motor vehicles operated for the purpose of carrying passengers or property for hire in interstate commerce.

To Seek Safety Pledge

WASHINGTON, July 16—The American Road Builders Association has announced its intention to launch a highway safety campaign on Oct. 1, a principal feature of which will be the issuance of pledge cards to all motorists and pedestrians who promise to use reasonable caution.

Calendar of Coming Events

SHOWS

Chicago .....Nov. 7-12
Exposition, Coliseum, Automotive Equipment Association.

Chicago .....Jan. 28-Feb. 4
National, Coliseum, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.

Chicago .....Jan. 28-Feb. 4
Automobile Salon, Hotel Drake.

Cleveland .....Sept. 19-23
Exposition, Public Auditorium, National Machine Tool Builders' Ass'n.

Cleveland .....Oct. 3-7
Exhibition, Public Auditorium, American Electric Railway Ass'n.

Cleveland .....Nov. 14-19
Convention Hall, National Standard Parts Association.

Cleveland .....Jan. 9-13
Public Auditorium, American Road Builders Association.

London .....Oct. 14-22
Olympia Passenger Car Show.

London .....Nov. 17-26
Olympia Truck Show.

Los Angeles .....Feb. 11-18
Automobile Salon, Hotel Biltmore.

New Haven, Conn. .....Sept. 6-9
Machine Tool Exhibition.

New York .....Nov. 27-Dec. 3
Automobile Salon, Hotel Commodore.

New York .....Jan. 7-14
National, Grand Central Palace, National Automobile Chamber of Commerce, including special Shop Equipment Exhibit.

Paris .....Oct. 6-16
Grand Palais.

San Francisco .....Feb. 25-March 3
Automobile Salon, Hotel St. Francis.

CONVENTIONS

American Chemical Society, Detroit, Sept. 6-8

American Electric Railway Association, Public Auditorium, Cleveland..Oct. 3-7

American Road Builders' Ass'n., Hotel Hollenden, Cleveland .....Jan. 9-13

American Society for Steel Treating, Convention Hall, Detroit....Sept. 19-24

Automotive Equipment Association, Coliseum, Chicago .....Nov. 7-12

National Association of Automobile Show and Association Managers, Drake Hotel, Chicago .....July 28-29

National Safety Council, Stevens Hotel, Chicago .....Sept. 26-30

National Standard Parts Association, Hotel Hollenden, Cleveland..Nov. 14-19

S. A. E.

National

Chicago, November—National Transportation and Service Meeting.
Chicago, Dec. 1—Tractor Meeting.
Cleveland and Detroit, Sept. 19-22—Production Meeting.
Detroit, Jan. 24-27—Annual Meeting.
New York, Jan. 12—Annual Dinner.

RACES

Altoona, Pa. .....Sept. 5
Atlantic City .....Sept. 5
British Grand Prix, Brooklands.....Oct. 1
Charlotte, N. C. .....Sept. 19
Detroit .....Sept. 10
Los Angeles .....Nov. 24
Salem, N. H. .....Oct. 12
Syracuse, N. Y. .....Sept. 3